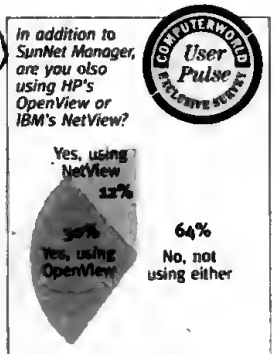
The Newspaper of Information Systems Management
January 9, 1995, Vol. 29, No. 2, 132 Pages, $6/Copy, $48/Year

COMPUTERWORLD

Sun to enhance net management

By Steve Moore and Jean S. Bozman
MOUNTAIN VIEW, CALIF.

Striving to retain its lead in the network management platform marketplace, Sun Microsystems, Inc. plans to launch a new enterprise management platform and a larger object-oriented management framework the week of Jan. 30, industry analysts and company sources said last week.



Sun will market the object-oriented Encompass product as the network management platform of choice for large enterprises, rather than its 5-year-old SunNet Manager product. However, it will continue to enhance SunNet Manager for its installed base of 12,000-plus sites.

Both SunNet Manager and Encompass will feed data to an umbrella framework for network and systems management called Solstice.

The object-oriented Solstice framework, which marries network and systems management, provides a corporate view of all managed systems. It also divides large networks into regional domains that can operate independently. That

Sun, *page 125*

IBM's kernel pops

Company scales back 'multiple personality' microkernel plan

By Ed Scannell

After two years of heralding the ability of its microkernel to support multiple "personalities," IBM has decided to deliver its first microkernel-based operating system at midyear with support for just a single personality — OS/2.

IBM officials stressed they would provide other personalities in future operating systems, but they declined to say which operating systems and when they might deliver them.

IBM also said it will more aggressively pursue relationships with other developers and manufacturers to use its microkernel technology to develop their own personalities.

Allowing users to swap in multiple personalities on the same microkernel means that one operating system could have the look and feel of several operating systems. One purported benefit is the potential to dramatically reduce training costs for both end users and internal developers.

Less is more

IBM's decision to scale back its ambitious goal of delivering OS/2 for the PowerPC with support right from the start for multiple personalities was largely based on the technical enormity of the task. But another factor was increasing feedback from users who wanted fewer, rather than more, environ-

IBM, *page 14*

Portable computing

Mobile users trek rocky road

By William Brandel
and Michael Fitzgerald

They may be on the front lines of battle in today's business world, but corporate road warriors still take to the field with far less data access capability than their office-based counterparts.

Ten years after portables first hit the road, applications for mobile users remain less capable. They also ship later and require a much greater level of support than desktop-bound programs do.

It takes twice as many information systems personnel to support mobile users, who also need twice as much training as their desktop counterparts, said Ken Dulaney, vice president of mobile computing at Gartner Group, Inc.'s Santa Clara, Calif., office. It also happens that those road warriors who need the most technical support are also the most reluctant to get training, analysts said.

Mobile users, *page 125*

Miles to go

Going mobile means negotiating a series of speed bumps for IS managers. These include the following:

- **Less bandwidth** – LANs have 4M bit/sec.; T1 lines have 57K bit/sec.
- **Upgrade issues** – Large files choke remote networks.
- **Training** – Users must come into the office for training.
- **Costs** – On-line queries can run up phone bills.
- **Backup** – Use of remote hard drives increases the chance that backup will not occur.

Printer **panacea?**

Don't be fooled by plummeting prices. Color printers are more affordable than ever, but IS headaches multiply as more of them are installed. Beware of labor and supply costs. See the **CW Guide** on page 90.

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NT Server lures NetWare shops

By Laura DiDio

The great debate over whether Microsoft Corp.'s Windows NT Server 3.5 is an operating system or a full-blown network operating system — capable of competing head-to-head with Novell, Inc.'s NetWare 4.x — is a no-brainer for some Fortune 1,000 firms.

IS director Jesse Rodriguez *made the leap from NetWare to NT*

Some information systems directors are relying on NT Server 3.5's capabilities as a full-fledged network operating system and deploying it as the strategic foundation for their enterprise networks. These us-

NT Server, *page 12*

Contract issues

D&B cracks down on code tweakers

By Rosemary Cafasso

If Dun & Bradstreet Software customers have been playing fast and loose with code modifications, they could be heading for some serious headaches.

Last week, the Atlanta-based company confirmed it had dispatched a letter to several thousand mainframe customers suggesting they double-check their contracts to make sure they are not violating code modification policies in making changes to D&B Software code.

"We were surprised and curious about the letter," said Gerald Creaven, an applications development manager at Woolworth Corp. in New York, a longtime D&B Software user. Like many customers, Woolworth has previously modified code to customize its applications.

D&B, *page 16*

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What's Inside

January 9, 1995

HeAD OF THE CLaSS

LOOKING TO HIRE THE BEST AND BRIGHTEST AVAILABLE IS TALENT FRESH OUT OF COLLEGE? YOU DON'T HAVE TO HEAD FOR AN IVY LEAGUE SCHOOL. ANYSTATE-U WILL DO JUST FINE. LEADING CAMPUS RECRUITERS SAY YOU CAN FIND THE RIGHT MIX OF TECHNICAL AND BUSINESS SKILLS IN GRADUATES CLOSE TO HOME

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NEWS

■ **Cisco** will roll out a new router platform in the second quarter in an attempt to bring its high-end 7000 product line up to par with Wellfleet. *Page 4*

■ IBM plans later this month to deliver on a promise to allow PCs to connect directly to any server running its CICS transaction monitor. That would reduce the need for separate gateway servers. *Page 4*

■ More **client/server** software providers are jumping on the fixed-price bandwagon. *Page 10*

■ **Apple** has finally licensed its proprietary operating system and hardware components to two companies, which should give rise to the long-awaited clone market. *Page 12*

■ Early users are happy with **Sybase's** Navigation Server parallel database product but are eager to see more features added. *Page 14*

■ Some **Digital** users are breathing easier because the company's stock has been on the rise since July. *Page 15*

COMPUTER INDUSTRY

■ **Unisys** will cut 4,000 jobs during the next two months as it whittles away at mainframe manufacturing operations in favor of the information services business. *Page 32*

DESKTOP COMPUTING

■ *Computerworld* test drive: **Dell's** new Latitude XP warms the hearts of cross-country travelers, while exceptional design makes **IBM's** ThinkPad 755CD notable. *Page 42*

WORKGROUP COMPUTING

■ **Novell's** challenge to Lotus' Notes takes form through a deal with Collabra. *Page 49*

ENTERPRISE NETWORKING

■ Users are warned about weaknesses in Unix NFS security. *Page 57*

LARGE SYSTEMS

■ Reservation firm Galileo International and Xerox are among those working with Unix in traditional big iron roles. *Page 63*

APPLICATION DEVELOPMENT

■ Oracle and Sybase do not yet offer full-functioning **multimedia databases**, but the companies plan to meet a gradually growing IS demand for such products this year. *Page 73*

Managing Software Maniacs

Prima donna developers. Know-it-all consultants. Just the usual characters you have to deal with if you're a software development chief. How do you handle them? One manager reveals his secrets. **See page 99.**

MANAGEMENT

■ If you really want valuable answers from your CEO, you'd better learn to ask **better questions**. *Page 84*

CAREERS

■ **Tight training budgets** are prompting companies to pool their resources to educate their staff. *Page 101*

COMMENTARY

■ **Charles Babcock** says Microsoft owes much of its success to its recognition of potential rivals as valuable third-party partners. *Page 8*

■ **Bill Laberis** wants Congress to put some teeth in software piracy laws and the courts to take a bite out of those who flaunt such laws. *Page 34*

■ **Elaine Schmerbeck** wonders where this new IBM, golf shirts and all, came from, but she likes it. *Page 35*

■ **Paul Strassmann** warns that not only is E-mail not a cure-all, it may not even be right for some very successful companies. *Page 35*

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Executive Briefing

IBM has scaled back its original strategy of having OS/2 for the PowerPC support **multiple personalities** and, for now, will have it support only one. Company officials said IBM will add support for other personalities — giving a single operating system the look and feel of several others — over time but declined to say which operating systems and when they might be delivered. *Page 1*

Sun Microsystems is expected to launch a new enterprise management framework at the end of the month that marries network and systems management. The **Solstice** object-oriented framework must turn the tide against Hewlett-Packard's OpenView and IBM's NetView/6000, which have been outpacing SunNet Manager sales growth. *Page 1*

Many user corporations looking to do sales force automation are finding their way through the fray, where more than 500 companies are fighting for attention. Companies such as **Metro-Goldwyn Mayer, Armstrong World Industries** and **John Hancock Financial Services** are among those combining off-the-shelf and home-grown packages to give sales representatives added capabilities. *Page 41*

There's no question that Asynchronous Transfer Mode (ATM) will bring users higher data transmission speeds, but users and analysts disagree about whether — and when — ATM will reduce the cost of **network management**. *Page 57*

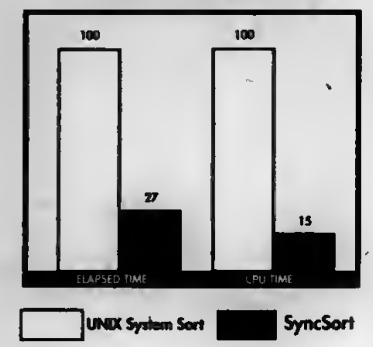
Conducting secure electronic data interchange (EDI) across the Internet could be a major boost to commercial customers, enabling flexible, ad hoc links between trading partners at lower costs than traditional value-added EDI networks. **With an eye on last week's rhubarb over having to pay royalties for access to** CompuServe's graphics interchange format, two enterprising software programmers say they've come up with an alternative that they're willing to distribute for free. *Page 6*

The 5th Wave *by* Rich Tennant

"It says, 'Seth - Please see us about your idea to wrap newsletter text around company logo. Production.'"

The UNIX System Sort

PERFORMANCE



FUNCTIONS

	UNIX System Sort	SyncSort
RECORD FORMATS		
Fixed length binary	NO	YES
Variable length binary	NO	YES
ASCII Text	YES	YES
RECORD PROCESSING		
Selection	NO	YES
Reformatting	NO	YES
Summarization	NO	YES
Grouping	NO	YES
COLLATING SEQUENCES		
Standard ASCII	YES	YES
EBCDIC	NO	YES
User Defined	NO	YES
Multi-byte	NO	YES

UNIX has its advantages, but its System Sort isn't one of them.

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XINU

Cisco plans to boost router muscle

By Stephen P. Klett Jr.

Cisco Systems, Inc. is prepping a CPU upgrade and new chassis form factor for its 7000 router line that will more than double the performance of current 7000 boxes and give users more flexibility.

The company is slated to start rolling out three new 7500 series routers in the second quarter, according to internal documents obtained by *Computerworld*.

Leading the charge will be the high-end 7520, which will attempt to catch up with and compete head-to-head with Wellfleet Communications, Inc.'s Backbone Concentrator Node (BCN) router, sources said. Cisco in San Jose, Calif., will also roll out the 7500 and 7510, which will be chassis upgrades to the 7000 and 7010 boxes, respectively.

Mel Lively, *network manager at Presbyterian Healthcare*

Second processor

Capacity will range from five to 13 slots, and for the first time, the 7510 and 7520 will include dual CPUs, which will eliminate the host processor as a single point of failure in the 7000. This has been a source of concern for some users.

"The 7000 does not have dual processors, so Cisco's idea of redundancy has been to have two routers, which is very pricey and is why we went with Wellfleet," said Troy Williams, a communications analyst at Household Credit Services, Inc. in Salinas, Calif. Wellfleet's BCN supports redundant power supplies and processors.

"The CPU has been a single point of failure in the 7000. Dual processors should provide full fault tolerance, which is great news," said Jon Castle, a message engineer at Cisco site Commonwealth Edison Co. in Chicago.

Sources said the 7500 line will boost redundancy by supporting hot-swap capabilities, which is also good news to users.

"It's important that they build these things like a tank because they're always in a mission-critical position," said Mel Lively, network manager at Presbyterian Healthcare Systems in Dallas.

Presbyterian plans to buy some new 7000s in the third quarter and will now probably buy the 7500. Lively said "The 7520 sounds like it will be the ticket because it should provide the horsepower to handle ATM, which is good news."

Performance and reliability aside, Castle said the added capacity of the 7520 is appealing because free slots are at a premium in Commonwealth Edison's routers. "The bigger chassis allows you to put everything in one router at a central site," he said.

According to the Cisco documents, the 7500 series routers will support a new interface processor called Viper, which will provide switching performance of 50,000 packet/sec. per card. A fully configured 7520 with dual CPUs and 11 Viper interface cards will have an aggregate performance of 550,000 packet/sec.

Analysts and users said the performance boost was vital to the 7000, which has lagged the BCN in several areas, including fault tolerance and aggregate throughput. However, some questioned customers' willingness to upgrade to yet another new platform.

Getting closer

Cisco's 7500 series will more than double the power of the 7000 line, but the BCN still leads on paper

Performance (packet/sec.)	250,000	550,000	700,000
Available	Now	Q2 1995	Now
Architecture	Single processor	Distributed multiprocessing	Symmetric multiprocessor
Hot-swapping	No	Yes	Yes
Redundant power	Yes	Yes	Yes
Redundant CPU	No	Yes	Yes
	Cisco 7000	Cisco 7520	Wellfleet BCN

"Cisco's going to have to answer questions about where this leaves customers in terms of a migration path," said Valentin Sribar, an analyst at Meta Group, Inc. in Reston, Va.

Interfaces for the 7500 will be backward compatible with current 7000 series routers and vice versa. However, Cisco AGS+ router interfaces will not be compatible, sources said.

Cisco would not confirm exact form factors or performance numbers because they are subject to change before the products are released. However, a spokesman did confirm that a 7000 upgrade is in the works for midyear.

"We are working on an extension to the 7000 family that will include a new form factor chassis and upgrade to the central CPU," said Larry Lang, senior product line manager. "ATM and channel attachment that will require more horsepower [in the 7000] and the extra oomph we're putting in the 7500 [line] should handle them."

Wellfleet, now part of Bay Networks, Inc., will release two processor upgrades this year designed to boost the performance of the BCN to more than 1 million packet/sec., said Jim Hourihan, product marketing manager.

First out of the gate will be the 68060 processor upgrade in March, which will raise performance to an even 1 million packet/sec. This will be followed by another processor upgrade called Bluefish in the third quarter that will boost performance to 1.3 million packet/sec.

PCs to gain direct connection to CICS server

By Craig Stedman

IBM plans later this month to deliver on its promise to open up client access to the CICS transaction monitor so PCs can connect directly to any CICS server. The new approach will also make it easier to build graphical user interfaces (GUI) for CICS applications, according to IBM officials.

Sources close to the company said the universal client access capabilities are scheduled to be announced the week of Jan. 23. IBM initially will support DOS, 16-bit Windows, OS/2 and Macintosh clients, and 32-bit Windows desktops should be added to the mix later in the year, officials indicated.

Customers said the direct server connections and increased GUI support sound like welcome extensions of CICS, the widely used transaction monitor that runs on all IBM hardware platforms as well as Unix systems from Hewlett-Packard Co. and Digital Equipment Corp.

Inside CICS

IBM's new CICS client architecture will include the following components:

- Consistent interface across all clients.
- CICS kernel supporting communication between clients and CICS servers.
- External Call Interface allowing GUI-based applications to access newly written programs on CICS servers.
- External Presentation Interface enabling GUI front ends to be added to existing CICS applications running in 3270 terminal emulation mode.
- 3270 terminal emulator with link to printers.

Universal client access is intended to allow PCs to be tied directly to CICS servers on mainframes, AS/400s and Unix machines via SNA or TCP/IP. That would reduce the need for a separate CICS for OS/2 or special terminal emulation gateways, users said.

MEMC Electronic Materials, Inc., a maker of semiconductor wafers in St. Peters, Mo., currently dedicates an IBM RS/6000 as a gateway server. It connects desktops emulating 3270 terminals to the CICS/6000 monitor that runs its order and production management system. Ed Wehner, manager of business information systems at MEMC, said a direct SNA-over-TCP/IP link should eliminate the need for terminal emulation and improve response times.

MEMC is a beta site for Macintosh and Windows client software, and it expects to start using the code in the next couple of weeks, Wehner said. The RS/6000 gateway server will remain in place for users who do not have PCs, "but now we can open it up for running some different things," he added.

Stan Johnson, director of IS at Worldport LA, the port authority in Los Angeles, said he likes the idea of bypassing OS/2 as a means of linking PCs to his mainframe CICS software in the future. "We're trying to go to less operating systems, not more," he added.

"There should be better reasons to buy OS/2," noted Jim Johnson, chairman of The Standish Group International, Inc., a market research and consulting firm in Dennis, Mass. Besides IBM's promise of more open access, the company's development of a unified CICS client interface is another positive step, he said.

The increased GUI support being added through a pair of interfaces will also fill in a big missing piece for CICS, said Ezriel Gross, a software systems consultant for transaction processing at Metropolitan Life Insurance Co.'s data center in Parsippany, N.J. "That's an 'about time' type of thing for IBM," Gross said. "Everybody wants a GUI today."

IBM's Hancock resigns

By Craig Stedman

Ellen Hancock is leaving her high-profile job as senior vice president in charge of IBM's software and networking operations. The surprise move by the longtime IBM executive came as part of a reorganization in which the company's software business is expected to be split into a number of smaller units, sources close to IBM said.

Longtime IBMer Ellen Hancock *is leaving*

Details of the software reorganization remained sketchy late last week. IBM also had considered further consolidating its software activities to form a single IBM Software Co.-type operation. But IBM Chairman Louis V. Gerstner decided to go in the opposite direction, sources said.

A secretary in Hancock's office said she was on vacation last week and unavailable for comment. An IBM spokesman refused to confirm or deny reports that she was leaving. The software reorganization is also "speculation at this point," the spokesman added.

Howard Anderson, head of The Yankee Group in Boston, said he expects IBM to break up Hancock's duties into two or three jobs.

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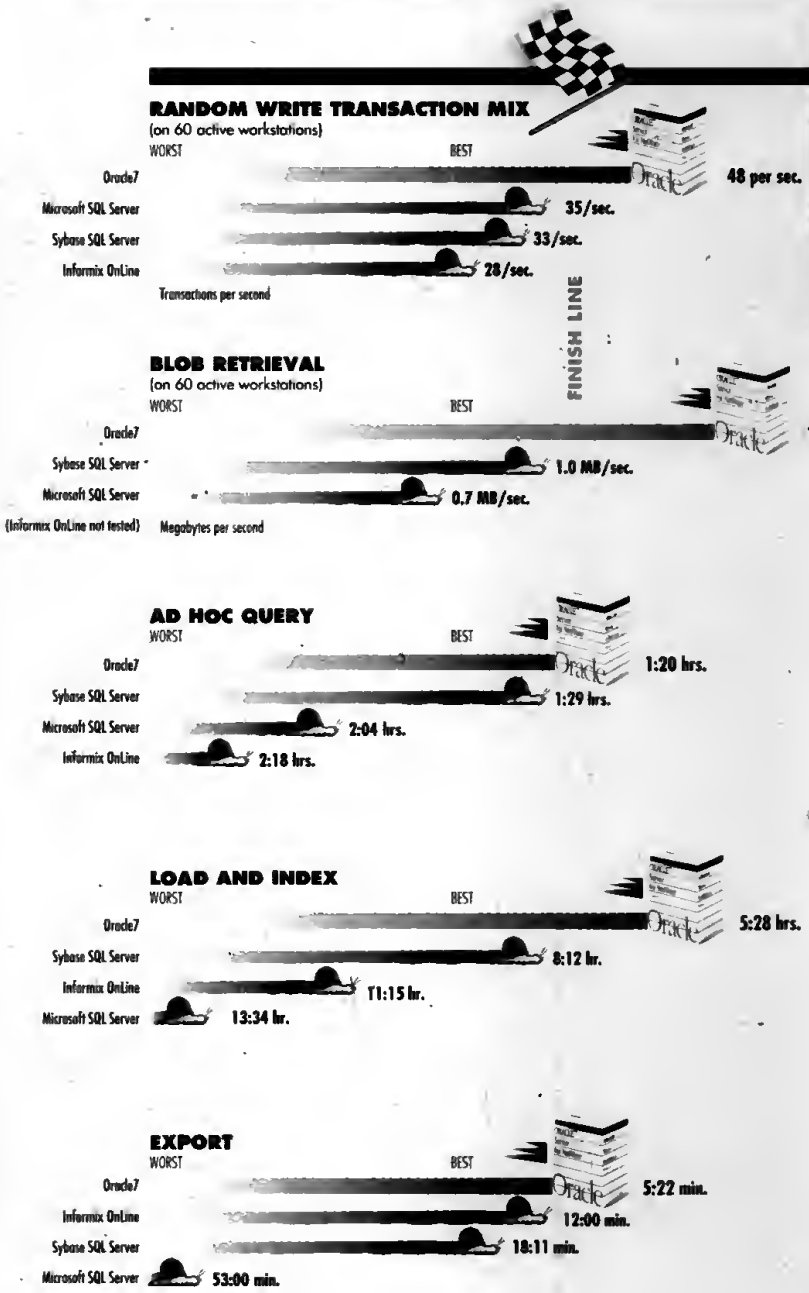

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ORACLE

Users outraged over fees for GIF format

Two programmers are offering a free alternative

By Julia King

In the midst of last week's uproar over CompuServe, Inc. charging on-line software developers a fee for technology that has been free for years, it took two irato programmers less than three hours to piece together a workable alternative to the controversial LZW data compression algorithm.

The programmers, both employees of Telegrafix Communications, Inc., a multimedia software company in Huntington Beach, Calif., broadcast news of their alternative algorithm on the Internet and CompuServe early last Thursday. They said they will deliver it free of charge to any and all who want it.

The catch is that CompuServe must approve the new algorithm's inclusion in its popular graphic interchange format (GIF).

Last week, electronic communications were flying fast and furious among CompuServe, Telegrafix, Unisys Corp. — which holds the patent for the LZW algorithm — and thousands of on-line users and software developers.

"Things are just insane here," Jeff Reeder, a senior programmer at Telegrafix, said late Thursday afternoon. "The whole controversy has the on-line electronic industry in an uproar."

The rhubarb started Dec. 29 when CompuServe posted an on-line memo informing software developers of an agreement it reached with Unisys, whose LZW compression algorithm is embedded in GIF.

According to a CompuServe spokesman, the company had no idea that Unisys held a patent on the compression technology until January 1993 when Unisys informed CompuServe of its ownership rights. The two companies then went into negotiations, coming up with a licensing agreement 18 months later in June 1994.

But why developers were not immediately informed of the deal — under which they must pay CompuServe a onetime registration fee of $1 and ongoing royalty fees of 1.5% or 15 cents for every licensed copy of software that uses GIF — remains a highly contentious matter.

When asked about the timing issue, spokesmen for CompuServe and Unisys essentially said they did not have a good answer.

The absence of a plausible explanation from either company has prompted users to accuse both vendors of sneakiness. "This was just a brazen stickup by CompuServe and Unisys. It's obscene," said Pat Clawson, president of Telegrafix.

"It almost seems [Unisys] was waiting until the industry got entrenched before they dropped the bomb," Reeder said. "It's hard to tell what's real and what's fiction. There are so many rumors flying now."

Last week, the Unisys and CompuServe spokesmen contradicted each other when asked about royalty amounts and where the money would end up. The Unisys spokesman described CompuServe's upfront royalty payment to his company as "insignificant." The CompuServe spokesman, meanwhile, deemed the amount "substantial."

The exact amount CompuServe paid Unisys, according to a Unisys vice president, was $125,000. "We don't view $125,000 for a company with revenue of $315 million as substantial," he added.

Initially, CompuServe also said it would act exclusively as a royalty conduit, passing on all fees it collected to Unisys. Later, the spokesman said CompuServe will pass on 11 of every 15 cents it collects in royalties and keep the remainder to cover administrative costs.

But according to the Unisys executive, CompuServe is also keeping the $1 onetime registration fee it is charging. That fee was never part of the Unisys/CompuServe agreement, he said.

At Telegrafix, the confusion and controversy egged Reeder and his colleague Mark Hayton to work even faster. For two days with no sleep, they researched published source code for various compression schemes. Finally, they hit upon an algorithm entered in a 1977 design competition, which was published in a past issue of *Dr. Dobbs*, a popular programming journal.

The two then checked for patents on the algorithm. Finding none, they combined it with source code for GIF viewing software developed by data compression guru Steve Rimmer.

"Two and one-half hours later we had a working solution," Reeder said. "The [alternative] algorithm will take any GIF output in the world and convert it to the new format. It also retains all of the architecture CompuServe invented with GIF."

Late last week, CompuServe Chief Technical Officer Sandy Trevor posted an electronic memo noting that the online service welcomes suggestions "and will seriously look at license-free algorithms or code that people will make available to us with no restrictions."

No license required

Unisys said most organizations offering World-Wide Web servers and home page offerings will not be required to secure a license. For more information, send an E-mail message via the Internet to lzw_info@unisys.com.

Electronic data interchange

Premenos pilots Internet-based EDI package

By Ellis Booker

While hundreds of companies exchange electronic mail and advertise wares on the Internet, very few conduct the essential business of business there. That is, few exchange purchase orders and invoices on-line.

When it comes to electronic data interchange (EDI), business trading partners continue to rely on value-added networks (VAN) or direct connections.

Will the rough-and-tumble Internet become a viable medium for EDI? At least one major EDI software vendor thinks so and is running two trials of the concept.

Premenos Corp. in Concord, Calif., is piloting Internet-based EDI with Cisco Systems, Inc., Avex Electronics, Inc. and National Semiconductor Corp. The trials were announced in November and December and are being fully implemented this month.

"We understood two years ago that X.400 [the international E-mail standard] wasn't going to be ubiquitous," said Lew Jenkins, Premenos chairman and founder. On the basis of this realization, he said, Premenos began to consider ways of conducting EDI independent of the underlying network.

He said that using standard public-key encryption technology over the Internet can satisfy the four requirements of an EDI transaction: authentication, integrity, nonrepudiation of recipient and nonrepudiation of originator. Premenos uses a scheme from RSA Data Security, Inc. in Redwood City, Calif.

Premenos, which counts companies such as The Coca-Cola Co., Microsoft Corp. and Blockbuster Entertainment Corp. among its customers, said it hopes to have a commercialized version of its Internet-based EDI package by the end of the first quarter. Pricing has not been determined.

Providers of value-added EDI networks are hardly shaking in their boots; officials tend to dismiss the Internet threat. Interestingly, a number have put themselves in touch with groups devoted to conducting business across the Internet (see box).

Users and analysts, however, are hesitant about choosing Internet-based EDI and typically cite security issues.

"It isn't safe enough," said Robert Drury, vice president of MIS at PET, Inc. in St. Louis. "At this stage we'll keep with direct connections and [VANs]."

At some point, Internet and EDI networks may run together, said Rick Villars, an analyst at International Data Corp. in Framingham, Mass. But even then, he said, the Internet will be more tuned to casual users and ad hoc connections for business-to-consumer and business-to-business transactions.

"We've listened to Premenos talk and know they are out there testing it... But we obviously are concerned about the security and would have to do extensive research to make sure [it works]," said Tom Mongoven, director of EDI at Bumble Bee Seafoods, Inc. in San Diego. Bumble Bee is a Premenos customer that currently trades with 170 locations over MCI Communications Corp.'s network.

Alternatives considered

Even so, Mongoven said Bumble Bee is looking at more cost-effective ways of conducting EDI, especially as it moves to just-in-time arrangements with its EDI-attached trading partners. "The VANs are figuring out different ways of billing for those kinds of transactions, and we're looking at alternatives too, such as setting up our mailboxes and network," he said.

Analysts agree that the security threat is real.

"The Premenos solution makes it possible to do this safely," but even with a firewall, a company with Internet access into its core applications is exposing itself to some risk, said Vic Wheatman, research director of electronic commerce strategies at Gartner Group, Inc. in Santa Clara, Calif.

Wheatman also said there may be hidden costs in EDI Internet, such as the expenses of the firewall systems and the software and personnel to run it all.

A final question the Premenos trials will have to answer is whether the approach is suitable for high-volume EDI traffic between partners — such as that between trading partners engaged in just-in-time inventory replenishment — or whether it will overtax those systems.

Smooth sailing

Premenos' approach is straightforward. Take an EDI transaction, wrap it in a standard Multipurpose Internet Mail Extension E-mail envelope and then apply public key encryption technology from RSA Data Security. On the receiving end, the incoming message is decrypted and processed normally.

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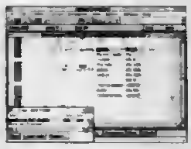

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Microsoft's weapon: Keep ISVs happy

Microsoft is viewed as a powerful marketing machine, and the strength of its position in the industry gives it obvious marketing advantages. But its prowess falls short of being able to sell salt water to sailors or russet potatoes to Idaho.

If Microsoft were a well-oiled marketing machine, it would have found a way to sell Windows NT in early 1994 rather than failing to meet Bill Gate's boast that it would sell a million copies in its first year. Microsoft won't reveal how many licenses it has sold (it's well short of a million) because it now says that number is not important.

Real marketing skill is a rare commodity. There is no Marlboro Man in the Silicon Valley outside the persona of Steve Jobs. If you want to see marketing skills in action, you have to watch sneakers or soap, not computers, and this is as true of Microsoft as anyone.

Fortunately for Microsoft, it doesn't depend on marketing.

It has another means of winning acceptance for its products in the face of marketplace indifference. That hidden asset is the way it relates to independent software developers and encourages them to surround Microsoft's core technologies with products that add to their value. Microsoft's knack for understanding developers and meeting their needs, even when the third parties have aspirations to be competitors, has created a huge new industry. It's an industry in which many small companies invest their human and financial capital to supply add-ons to the Microsoft line.

In contrast with IBM, Microsoft has encouraged third parties from the start.

Charles Babcock

This was true for DOS, Windows, Visual Basic, NT, SQL Server and other pieces in the Microsoft menagerie.

What competitors see as a voracious, domineering company happens to be a focused company with highly leveraged technology. Instead of trying to do everything itself, it concentrates on a fundamental technology with which it wishes to compete (operating system, database, programming language) and then encourages others to invest in the same direction. In the first years of the IBM 360 and 370, IBM set the environment and, with barely restrained aggression, tolerated third parties that it viewed as parasites attaching themselves to it. In contrast, Microsoft, from the start, has encouraged third parties.

How does it do this? It stages developer conferences, offers plentiful documentation, shares bug fixes and technical notes and supplies copious examples of sample code. Microsoft's company culture believes that all software developers are sisters and brothers under the skin. Granted, little mercy is shown to powerful, outright competitors, but thousands of wanna-bes are tolerated.

Throughout 1994, Microsoft offered its product documentation, troubleshooting experience, technical notes and fixes on a quarterly set of 12 CD-ROMs, packaged with indexes and browsers, at a price of $195. An upgraded version includes Microsoft software developer's kits, which are enough for some people to start their own software business, priced at $495. It supplied 40,000 developers with these CD-ROMs in March; by October the number reached 110,000. Cameron Myhrvold, director of the Microsoft Developers Network, expects to supply 200,000 CD-ROM sets per quarter by mid-1995.

Microsoft has also staged six or seven DevCasts, where it puts its top development people on the air in a nationwide satellite broadcast. It dispenses reams of technical information off an Internet server in Redmond, Wash., the second most active File Transfer Program server on the 'net, according to Bob Miller, director of Microsoft's global networking.

It does all this for the greater glory of Microsoft. But so far, it is showing a real knack for sharing information with outside developers. Then all its marketing has to do is follow the crowd.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 373-2737

News Shorts

Takeover rumors swirled around **Apple Computer, Inc.** last week as reports circulated that **Oracle Corp.**, **Matsushita Industrial Electric Co.** and **Philips Telecommunications N.V.** met with Apple officials to discuss an Oracle-led takeover. That sparked jumps in Apple's stock, although several sources dismissed the reports. Two sources close to Apple did claim that last summer Oracle's board approved discussions between the two companies. Meanwhile, Apple and Oracle are discussing an interactive technology agreement targeted at set-top boxes. Oracle Chairman Larry Ellison said in a Dec. 11, 1994, *San Francisco Examiner Magazine* article, "We are not in conversation with Apple about mergers or anything other than joint technology." Just last month, Oracle was the subject of rumors that it was talking merger with **Lotus Development Corp.**

Sun hardware chief resigns

J. Phillip Samper, 60, president of **Sun Microsystems Computer Corp.**, announced late last week he will leave the firm in late February. Samper joined **Sun Microsystems, Inc.**'s hardware unit last February after serving on Sun's board of directors for two years. "Phil bailed me out by coming off the board to finish the reorganization I'd started," Sun Chief Executive Officer Scott McNealy said Friday. "It's been one of those wonderful board rescue missions and a nice orderly transition. But he's been commuting from Annapolis, Md., [to Sun's Mountain View, Calif., headquarters,] and he's tired of commuting cross-country." A replacement will be announced shortly, McNealy said.

Hopper retires from AMR

Max Hopper has reserved his flight out of **AMR Corp.** After 22 years at the company, Hopper announced last week he will retire Jan. 15 as chairman of **The Sabre Group**, AMR's information and reservation systems subsidiary. Most recently, Hopper, 60, has focused on strategic issues such as the development of multimedia capabilities for electronically distributing tickets directly to passengers.

NextStep Expo canceled

Next Computer, Inc. last week canceled its annual NextStep Expo show, which had been scheduled for June in San Francisco, in favor of a series of smaller, regional developers conferences. But doubtful users burned up the Internet last week questioning the wisdom of ending the highly visible show when Next is not yet perceived as a safe bet among many information systems managers.

Digital sells off more software

Digital Equipment Corp. last week unloaded another small piece of its software portfolio, selling its DSM line to **InterSystems Corp.** in Cambridge, Mass. Under the agreement, InterSystems will sell DSM worldwide and develop future versions of DSM. DSM is Digital's version of an application platform technology used in the health care field to run complex, high-performance database transactions. The price was not announced, but InterSystems CEO Terry Ragon said Digital's DSM sales totaled about $14 million last year.

Hearing on Microsoft decree

A final hearing is slated for Jan. 20 in Federal District Court in Washington on the **Microsoft Corp./Department of Justice** decree. Separately, Samuel R. Miller, the attorney who headed the Justice Department's investigation of Microsoft, has resigned to return to private practice. Meanwhile, the department's examination of Microsoft's proposed acquisition of **Intuit, Inc.** continues.

Oracle due for low-end tools

Oracle plans next week to announce several new low-end databases and development tools, as well as relaunch some existing products, under the new banner of Workgroup/2000. Meanwhile, curious Internet users can get a taste of the Microsoft Corp. Windows NT version of Personal Oracle 7 by downloading a 90-day trial copy from http://www.oracle.com.

Computer industry grows in 1994

The global market for information technology services grew at a rate of almost 5% in 1994, reaching a total of $164 billion, according to **International Data Corp.** (IDC) in Framingham, Mass. At $10 billion, the fastest-growing market segment in the U.S. was the operations services business, which includes the management of networks, distributed databases and other information technology assets by outside service providers. IDC forecasts this market will continue to grow through 1999 at a rate of 17% annually.

Microsoft introduces 'Bob'

Microsoft announced a new user interface aimed at the home market during last week's Consumer Electronics Show in Las Vegas. Called "Bob," the interface — which runs on top of Windows — lets a user interact with the computer using a "room" metaphor. For example, clicking the mouse on a sheet of paper lying on a desk lets the user create a document using a limited word processor. Bob will cost $99 and will be ready in late March.

SHORT TAKES **Dell Computer Corp.** said its OptiPlex line of desktops will contain only the updated versions of Intel Corp.'s Pentium chip.... **Florida Power & Light Co.** last week named Dennis Klinger as the utility's chief information officer. Klinger, formerly CIO at Ryder System, Inc., replaces William O'Brien, who retired.... **Computer Associates International, Inc.** last week unveiled an AS/400-based integrated manufacturing system, CA-KBM, which uses a knowledge engine for configuring complex, customized orders.

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ORACLE

Client/server takes fixed-price tack

By Rosemary Cafasso

With more users insisting on client/server cost controls, more software providers are taking the hint and delivering fixed-price software packages.

Next week, Walker Interactive Systems, Inc. in San Francisco will roll out Quick Strike, which was designed for pilot projects and comes with a guaranteed price. A low-end version of the package that supports six users and offers consulting and one financial software module will cost $106,000. A high-end version with three modules, consulting and support for 18 users will cost $318,000.

In addition, a Dun & Bradstreet Software spokeswoman last week confirmed that the company is seriously evaluating fixed pricing and will likely announce a plan by the end of the first quarter.

These moves follow launches last year of fixed-price packages from SAP America, Inc., Oracle Corp. and Ross Systems, Inc. The vendors claim these packages are a big hit. SAP said it will add Special Delivery to the product list of its entire sales force, thus expanding its availability from a small set of salespeople. Ross Systems said it expanded its fixed-price offerings beyond human resources and financials and recently added a fixed-price pilot project for its manufacturing software.

The good news is these packages help users battle runaway client/server costs and plan better migration strategies. Most bundles include a set fee for consulting services that the vendor guarantees not to exceed. Consulting fees are often a source of unexpected additional costs in these projects.

The wrap on package deals

Company/ Product	Features	Price
Walker Interactive Systems/ Quick Strike	Up to three financial software modules, support for up to 18 users	$106,000 or $318,000
SAP/ Special Delivery	Basic financial applications, database, hardware and consulting services	$500,000
Oracle/ Quickstart	Basic financial applications, database, hardware and consulting services	$400,000

Trammell Crow Co. in Dallas recently worked a guaranteed price deal with Ross Systems. Nancy Herring, an operations manager, said the big plus was getting a fixed price on the consulting piece of the business.

"The benefit is a lot of companies sell you software and then they want to sell you consulting," Herring said. "That can be an unknown. I don't care how much homework you do. With Ross, we didn't have to worry about that."

Pricing limitations

The downside to fixed pricing, however, is that these packages typically come with a fair number of restrictions — such as not allowing code modifications or providing applications with only certain databases — which could end up excluding plenty of users.

"I think more and more companies will be doing this," said Bobby Cameron, a senior analyst at Forrester Research, Inc. in Cambridge, Mass., although he also said the typical preconfigured package is not for everyone. "It's a good way to get started in client/server," he added.

Some users who have chosen a fixed-price deal also said these arrangements are not as restrictive as they may appear.

Ruth Westra, the financial systems coordinator at *The Seattle Times*, oversees a fixed-price SAP Special Delivery system that was installed last year. Although Westra would not reveal what her company paid for Special Delivery, she said it was less than the list price of $500,000 because the newspaper was an early customer and was able to negotiate.

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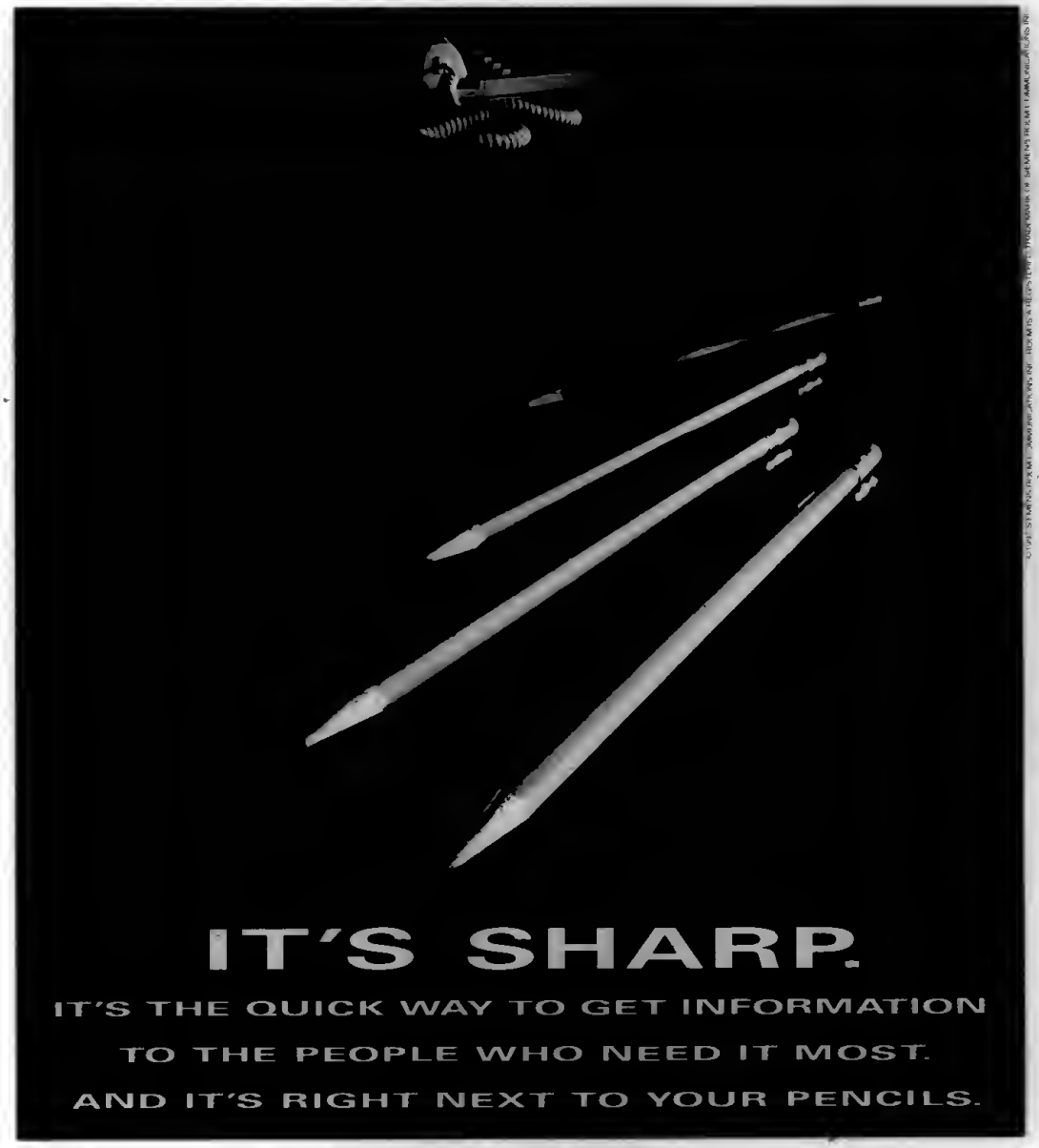

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Apple users shrug off licensing deals

By Ed Scansell

■ After years of waffling, Apple Computer, Inc.'s recent decision to license its proprietary Macintosh operating system and hardware components has met with dull enthusiasm from many users.

Apple has licensed Mac OS to Power Computer Corp., a small hardware supplier in Milpitas, Calif. The deal also allows Power Computer to manufacture Macintosh clones and system components for its own use and lets it resell those products to other third parties.

Separately, Radius, Inc. in San Jose, Calif., was licensed to build Macintosh clones that target specialized markets such as high-end publishing and various video applications.

However, the agreements come at a time when Macintosh prices have dropped significantly and industry debate centers on whether the latest Windows is attracting defectors from the Apple camp.

"If this happened five years ago, it would have been better. This is like closing the barn door after the horse has left," said Robert Anderson, a senior analyst of re-engineering and information services at A. O. Smith Automotive Products, Inc. in Milwaukee.

"It was something I'd been wanting for some time because Macs were so expensive," said Edward Faith, editor at Faith Publishing in Berkeley, Calif. "But Apple has now priced the product cheaper, so the licensing agreement doesn't make much of a difference."

Anderson and other information systems executives said they are seriously considering switching to Windows because of its more specialized or niche applications. Developing such applications has become financially infeasible for many smaller Macintosh developers, some users said.

Looking for more cuts

Other users were more optimistic about the agreements. They said the presence of Macintosh clones leaves room for even more price cutting by Apple while also providing a second source for systems should Apple run into supply problems.

"To have a second source for [Apple-compatible] machines will be beneficial. Larger companies have always held it against Apple because they did not have a second source for its machines," said Brian Connes, manager of the information center at DHL Worldwide Express, Inc. in Redwood City, Calif.

But even those users encouraged by the deals worry that overly aggressive pricing will dramatically cut into Apple's traditionally generous earnings. This would inhibit the company's ability to continue aggressively investing in research and development.

"If you cut too deeply into the R&D efforts of the golden goose, that is not good. I would rather see them keep margins up and reinvesting in the products to keep them state of the art," said Bill Monteith, executive director of Mac IS in Mason, Ohio.

The first clones are not expected to reach the U.S. market until late in the first half of this year, according to spokespeople from Apple and Power Computer. However, they declined to say how aggressive the pricing for clone machines would be.

"We intend to maintain a very aggressive entry-level price point for our systems through innovative designs and manufacturing," said Stephen Kahng, Power Computer's president.

Power Computer will supply these components to other licensees of the Macintosh operating system. Spokespeople for Apple and Power Computer declined to comment on negotiations being held with those potential licensees.

Expo focuses on wireless, Newton

By Suruchi Mohan
and Michael Fitzgerald
SAN FRANCISCO

Wireless computing took center stage at last week's MacWorld Expo here with a decided emphasis on both the mobile warrior and more specifically, Apple Computer, Inc.'s Newton.

Looking to expand the market was Motorola, Inc., which announced Marco, its version of Apple's Newton MessagePad personal digital assistant (PDA). Marco, which includes a licensed copy of the Newton operating system, is a 1.8-pound, $900 to $1,400 product with built-in wireless communications.

Swimming in products

Apple kept busy announcing a raft of products, including the Apple Mobile Message System, which is designed to bring wireless messaging to any PCMCIA-equipped notebook or the Newton MessagePad. The system costs $549, plus $19.95 for basic monthly service.

Also jumping on the PCMCIA bandwagon was Dayna Communications, Inc., which announced a variety of connectivity products or initiatives. The Salt Lake City company said it was developing a wireless LAN PCMCIA card for Newton and also introduced Version 1.1 of its DaynaComm Roamer wireless LAN adapter.

Digital Ocean, Inc. announced Tarpon, a PDA that integrates Newton with Digital Ocean's wireless connector, the Grouper. Tarpon will ship in the second quarter and will cost approximately $3,000.

MACWORLD EXPOSITION

But there was more to the show, which was attended by about 70,000 people, than just wireless announcements. Apple formally announced it had licensed its Macintosh operating system to Power Computing Corp. and Radius, Inc., opening the market to Macintosh clones (see story at left).

Apple also said it will include Windows client software with its workgroup servers. These servers — the 6150, 8150 and 9150 — will cost 5% to 11% less than current prices, effective immediately. And Apple has cut the hourly rate for its on-line service, eWorld, by almost half to $2.95 per hour.

Other announcements, many of which are Macintosh follow-ups to their PC counterparts, included the following:

- **Caere Corp.** announced immediate availability of OmniPage 2.0, an optical character recognition product for Macintosh.
- **Claris Corp.** revealed it is developing a version of FileMaker Pro, its database software for Macintoshes and PCs, that will include relational database capabilities.
- **Digital Communications Associates, Inc.** announced the availability of OpenMind, its client/server groupware product for Macintosh.
- **Farallon Computing, Inc.** unveiled plans to create a line of "fast" Ethernet products, such as cards, hubs and bridges, for the Macintosh market.
- Microsoft Project 4.0 for Macintosh from **Microsoft Corp.** will play catch-up to the Windows product, which has been shipping for six months. Currently, the Macintosh version is being beta-tested. It is expected to ship in the spring.
- **StarNine Technologies, Inc.** announced EMail-On-Demand, a software product for the Macintosh that lets users create and maintain an electronic-mail response system on the Internet or their E-mail accounts.

NT Server lures

CONTINUED FROM PAGE 1

ers say they believe NT Server 3.5's strength as an applications server — as yet unmatched by NetWare 4.1 — is what they need to take them beyond today's basic file and print networks and achieve a true client/server environment.

Analysts offered some caveats, though.

While NT Server 3.5, which has been shipping since last September, is going through a growth spurt, International Data Corp. analyst Lee Doyle said NT Server, with 5% market share in 1994, still has to play catch-up to NetWare's 69% share.

"NT Server 3.5 has momentum, but I'm still skeptical. As of mid-1994, [Microsoft is] still selling as much of LAN Manager as they were of NT Server," Doyle said. He added that NT Server 3.5 is "viable as a backbone [network operating system]" but will likely continue to run second to NetWare in use.

Following the crowd

Still, many users such as Richard Warren, director of client computing services at Judd's, Inc., a magazine printer in Strasburg, Va., are jumping on the NT Server 3.5 bandwagon.

"The compelling argument in favor of NT Server 3.5 is that right now it can let me architect a real client/server network and overall provides better support for large-scale database and demand-intensive applications," he said.

Other users praised NT Server 3.5's reliability and scalability as an applications server as reason enough to deploy it as a backbone network operating system. Value-added features such as enterprise-wide security and autoreconnect capabilities also result in big savings, users said. Novell also has enterprise-wide security and just added autoreconnect capabilities to its Virtual Loadable Modules in December.

Overall, users emphasized Microsoft's desktop dominance, coupled with the applications services of NT Server and promise of close integration between the Microsoft's FrontOffice and BackOffice product suites, as cogent reasons to adopt NT Server 3.5.

"From Day 1, NT Server was a rock-solid, very powerful network operating system and not just a desktop [operating system]," said Bob Bowman, chief information officer at Deaconess Health Systems, one of the largest health-care providers in the St. Louis area with 750 users at 30 sites.

NT Server 3.5 will let Deaconess grow its applications and scale them to bigger platforms without having to redesign the applications, Bowman said.

"That [amounts to] $100,000 savings in development costs for each application," he said. "Commercial software developers currently charge about $50 per hour, and it takes an average of two developers working six months or roughly 2,000 manpower hours to build small and medium applications."

Bowman's experience is becoming increasingly typical of many large customer sites, including staunch NetWare strongholds.

Jesse Rodriguez, the director of information technologies at the Unified School District in Tucson, Ariz., said he suffered pangs of guilt over his recent decision to convert 100 NetWare servers to 109 Windows NT Server 3.5 systems.

"It was a very, very tough decision since we've used Novell since 1986," Rodriguez said. "To achieve the same level of applications support with NetWare 4.x that I get with NT Server 3.5 and SQL Server 4.21A, I would have to buy both a NetWare 3.12 server and a Sybase NLM, which is outrageously expensive — over $20,000 per server."

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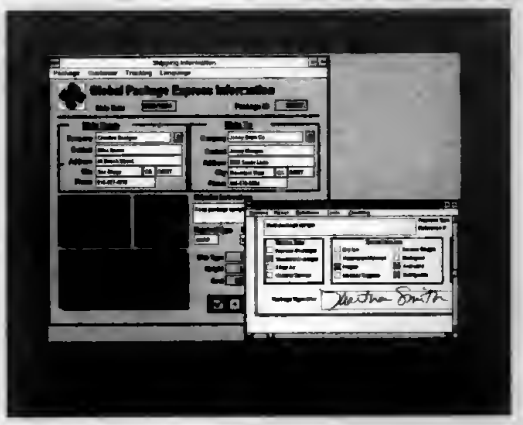

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Some returns dog OS/2 Warp debut

By Ed Scannell

While IBM was busy announcing that it had sold 800,000 copies of OS/2 Warp in less than two months, some users were busy pointing out their problems installing and configuring the operating system over DOS and Windows environments.

In two isolated cases, resellers last week said they were logging up to 50% return rates, mainly from first-time users inexperienced at installing operating systems. Other resellers, however, said they had less than 10% return rates, which they described as normal.

"Most users returning [OS/2 Warp] expected it to be like pixie dust they could sprinkle on top of Windows, and poof, they would have a 32-bit system," said Sam Geller, owner of a south Florida-based retail outlet. "But you have to have some experience at configuring things to get it to work right."

A small number of corporate users also complained about installing OS/2 Warp on some of their clone machines, saying that the program's installation and configuration process was not as straightforward as IBM officials said it would be.

IBM disagrees

IBM last week acknowledged that some inexperienced users are having trouble properly configuring OS/2 Warp but said the return rates are not nearly as high as some claim.

Some users who were part of the OS/2 Warp beta program said they suspect some of the glitches in the system can be attributed to its relatively short beta cycle. They said the product could have used another few weeks of testing.

"IBM has made good strides in fixing the installation shortcomings of previous versions, but not all the bugs are out of this yet," said John Harding, a technical consultant at Nevada Power Co. in Reno.

Other corporate users said they had little difficulty installing the product. They also noted that its performance on PCs with 4M bytes of RAM is reasonable. IBM is pushing the fact that OS/2 Warp can perform comfortably in 4M bytes as a major advance over previous versions of OS/2.

"While we haven't had too much time to play with it, we haven't had any problems installing it or with its performance," said Frank Petersmark, head of technical service at Amerisure & Cos., a large regional insurance company in Southfield, Mich.

Users' fault

"Inexperienced users often get messages that they don't have the right device drivers to load this or that or something is messed up in their CONFIG.SYS, but there is nothing to substantiate large numbers of returns," said an IBM spokesman. "In fact, we are on our second and third reorders to resellers."

IBM is "slip streaming" in a number of fixes to the Full Pack version of OS/2 Warp, which is still expected to be delivered by the end of the month, an IBM spokesman said. The fixes are expected to address various installation and device driver problems.

Yet some users are concerned that IBM may not be giving itself enough time to test the fixes and still meet its end-of-month deadline.

"Based on the Microsoft problems [with delivering Windows 95], I hope IBM will be careful about pushing Warp out too fast," Petersmark said.

Corporate users also said they have had trouble getting the 32-bit operating system to work properly with Novell, Inc.'s OS/2 requester for NetWare 3.x servers. They said files get hung up or lost between server and client systems.

In the meantime, Novell has announced that users can download a new version of NetWare Client, called Version 2.11, from CompuServe. IBM officials say it addresses these problems. A version on diskette with full documentation is expected to be released sometime this month, a Novell spokesman said.

Sybase server OK first step

By Kim S. Nash

Early users of Sybase, Inc.'s Navigation Server commended the product last week as a good first step in letting Sybase systems handle large amounts — tens and hundreds of gigabytes — of data.

But Navigation Server, which shipped late last month just under an end-of-1994 deadline, still needs some work, users said. For example, the parallel processing add-on does not fully support the latest version of Sybase's SQL Server database, known as System 10. And Configurator, a companion product designed to help users set up efficient Navigation Server systems, is not yet finished.

"We're experiencing the high performance but also some of the pain common in a new product," said user Michael Chayrez, director of data resources at US West, Inc.'s Marketing Resources Group in Englewood, Colo.

Navigation Server is a relational database designed to run on massively parallel processing (MPP) hardware and communicate with Sybase's flagship SQL Server database. The product is intended to anchor massive decision-support applications that SQL Server cannot handle alone. Data warehousing is the most obvious use for the product, although Sybase said it can be used for transaction processing as well.

US West is 10G bytes into migrating a 90G-byte customer information database from a turnkey Teradata Corp. system to Navigation Server. The product, Chayrez said, is "very stable" for a first release. Most of the pain is in learning how to set up Navigation Server for the fastest performance. Database administrators must consider the amount of data in question and how and what types of queries end users will make, among other factors, he said.

Still to come

Configurator, which would help Chayrez make some of those decisions, is not installed yet. That product was not ready when Navigation Server shipped to US West and other early users; Sybase and development partner AT&T Corp. have supplied on-site and telephone consulting instead.

Shaky start

Since Sybase announced it in November 1992, Navigation Server has been delayed at least twice, for a total of 12 months, while engineers at Sybase and AT&T worked on improving speed and performance.

By June, The Chase Manhattan Bank NA, another test site, plans to turn over to its marketing department more than 500G bytes of credit-card customer data housed in Navigation Server, said Jane Landeo, vice president of Bankcard Services at the New York-based financial firm.

Chase is moving the information off an IBM mainframe to AT&T 3600 MPP servers and will start training marketeers on graphical tools and query techniques on Feb. 15, Landeo said.

The migration "has gone really well," Landeo said. Chase, which is a Sybase showcase account, has two copies of Navigation Server, one on a 16-processor AT&T 3600 and one on a 112-processor box.

IBM scales back microkernel plan

CONTINUED FROM PAGE 1

ments to support, IBM sources said last week.

In the past year, IBM officials said they hoped to support the personalities of AIX, OS/2, DOS and Windows in the product's initial release. They were also strongly considering support for Apple Computer, Inc.'s Mac OS and Taligent, Inc.'s object-oriented interface.

"We have found it is really technically difficult to do all of this," an IBM spokesman acknowledged last week, adding that "customers would find it difficult to manage and support it all."

Regarding DOS and Windows

Meanwhile, users will be able to run DOS and Windows applications under OS/2 for the PowerPC, but in the same way OS/2 supports DOS and Windows on the Intel Corp. platform. That means DOS/Windows will not be supported as a separate personality, complete with its own file system and the other accoutrements associated with operating systems.

"When users boot up OS/2 for the PowerPC, it will come up like OS/2 Warp, and they will access DOS and Windows applications in the same manner as they do under Warp," an IBM spokesman said.

IBM's recent change of plan met with little resistance last week from users and analysts, who agreed that this strategy more logically supports their own plans.

"More and more users want direction from their vendors, not more choices. They are trying to simplify environments like operating systems because they are becoming too complex to manage," said John Handy, senior technology consultant at a large public utility in Gaithersburg, Md. "This move makes sense to me."

The decision also makes business sense for IBM, which can now deliver the twice-delayed OS/2 for the PowerPC by midyear more cost-effectively and with less strain on the company's technical resources. Some analysts said the move may also give IBM more mind share among corporate users as archrival Microsoft Corp. readies its own barrage of operating system deliveries this year.

"Giving users an infinite choice of personalities in what they hope will be a base-level operating system is simply not sustainable in an increasingly margin-thin business," said Richard Buchanan, a software analyst at Forrester Research, Inc. in Cambridge, Mass.

Still, some users were disappointed to hear of the decision, saying they were counting on the flexibility that multiple personalities would have offered them in various global strategies.

"If I'm going to buy a PowerPC and it can't run the Mac OS as well as NT or OS/2, what's the point? Why am I not buying a Pentium?" asked David Mallinckrodt, a technical consultant at Mallinckrodt Medical, Inc. in St Louis. "This is a detriment. Buying one platform to satisfy my Mac users and my IBM users was attractive."

"This decision is probably good for [IBM], but for us who use Windows as a base technology, it means that IBM is pushing itself further and further away from our radar screens," said Joe Awe, director of strategic technologies at PECO in Philadelphia.

Senior editor Michael Fitzgerald contributed to this story.

Digital stock, user confidence rise

By Neal Weinberg

■ A vote of confidence by Wall Street has raised Digital Equipment Corp.'s stock to nearly double its low point in July, and that has some Digital users breathing easier.

Digital stock slumped to less than $19 a share in early July but rose to more than $34 a share in the fall. It has since hovered at about the $33 range.

"I watch the stock, and I think to myself, maybe unconsciously, 'If the stock price is going up, maybe the company is stabler than I thought,'" said Richard Goulde, MIS manager at Commercial Metals Co. in Dallas.

Some of Goulde's VAX leases are running out next year, and he said he has some decisions to make. But the rising stock value "gives me more confidence in DEC," Goulde said.

> **"The recent rebound in Digital stock has done absolutely nothing to hurt their position in" Insteel's analysis of its hardware needs.**
>
> **— John Claxton, Insteel Industries**

"The favorable stock price movement reflects the attitude of investors and suggests the company's internal structure is improving. It certainly makes a difference to me and to my management," added David Sacco, IS manager for the Rolled Products Division at Alcan Aluminum Corp. in Cleveland.

Alcan, a major Digital user, deployed five Alpha servers and workstations in 1994. "Technologywise, we're very happy. And we're resting a lot easier that businesswise, things seem to be turning around as well," Sacco said.

No sure thing

"We happen to be in the process of reviewing our hardware platforms, and Digital is one of the vendors under consideration," said John Claxton, systems administrator at Insteel Industries in Mount Airy, N.C., a longtime Digital customer.

"The recent rebound in Digital stock has done absolutely nothing to hurt their position in this analysis," Claxton said. The front-runners in the search, which Insteel expects to conclude within six months, are Hewlett-Packard Co., Data General Corp. and Digital.

Still, Claxton is hedging his bets with a wait-and-see attitude. "It's a little early to take off the mourning cloths," he said. "Whether they have turned it around based on one point of the stock rebounding is hard to say."

Not everyone feels upbeat about Digital, especially users who have been dropped by the direct sales force as part of the company's new policy of servicing only the Top 1,000 customers directly.

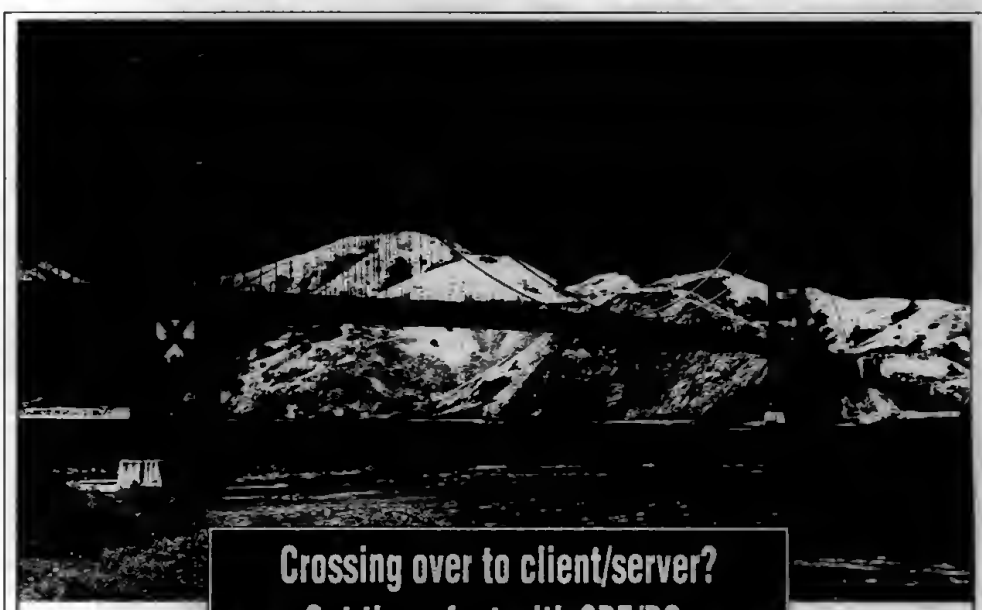
"I'm not terribly excited about what's going on," said Hal Kolp, computer operations manager at National Semiconductor Corp. in South Portland, Maine.

"They are forcing us to go to VARs, and I don't like that idea," Kolp said. "I feel abandoned." National Semiconductor is the largest VAX site in Maine, he said.

Duff & Phelps in Chicago issued a Buy recommendation on Digital last summer based on the company's promising Alpha sales and the fact that the "cost restructuring program seemed to be well laid out and had some teeth in it," said analyst P. Martin Ressinger.

In the past six months, the stock market has essentially endorsed Chief Executive Officer Robert Palmer's restructuring plan, Ressinger said.

John B. Jones Jr., an analyst at Salomon Brothers, Inc. in San Francisco, said the uptick in the stock represents more than bargain hunting. "People are saying there appears to be a real turnaround."



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CSC wins Hughes outsourcing pact

By Julia King

■ Hughes Aircraft Co. last week signed a $2.5 billion outsourcing megadeal with Computer Sciences Corp. (CSC) that involves transferring about 1,100 staffers, or 90% of Hughes' information systems organization, to CSC's workforce.

Under terms of the contract, CSC in El Segundo, Calif., will furnish IS services to Hughes corporate headquarters in Los Angeles and several operating units, including Hughes Aerospace and Electronics Co. and Hughes Space and Communications Co.

CSC said the Hughes outsourcing contract is its second-largest ever, after a $3 billion 10-year deal it signed with General Dynamics Corp. in 1991.

Long known as primarily a government contractor, CSC now derives 55% of its $2.9 billion in annual revenue from commercial clients.

Also last week, CSC signed a five-year, $10 million outsourcing pact with $2 billion Polaroid Corp. in Cambridge, Mass. Under that deal, CSC will acquire and manage all of Polaroid's mainframe systems, which currently support internal finance, marketing and distribution applications.

But deals such as the Hughes pact cement CSC's standing as a serious player in the commercial outsourcing arena, analysts said.

"It's definitely what we call a megadeal," said Susan Scrupski, editor of "InfoServer," an industry newsletter in Barnegat, N.J.

"It is a really key win for CSC," said Allie Young, a professional services analyst at Dataquest, Inc. in Framingham, Mass. "It removes any doubt that they're exclusively a federal government contractor."

Left out

Excluded from the Hughes outsourcing deal are "some key architectural systems engineering functions, which are an integral part of [product] design," said Gary Osborne, chief information officer at Hughes Space and Communications. The remaining 10% of Hughes' IS employees who do not go over to CSC will work on these systems, he said.

Growing list
CSC's commercial outsourcing clients now include Scott Paper Co., Mutual of New York and Ford of Europe's parts and service organization.

Also excluded from the CSC contract is desktop systems support for Osborne's division, which was outsourced last year to another GM subsidiary, Electronic Data Systems Corp.

"We were the initial [outsourcing] trial balloon," Osborne said, referring to the desktop deal with EDS.

Asked why EDS was not awarded the larger contract, Osborne said the company did not bid on it.

Wire fraud law falls short

Judge taps Congress for fixes in wake of piracy acquittal

By Gary H Anthes

After recently dismissing criminal charges against a university student accused of trafficking pirated software on the Internet, a federal judge turned the spotlight on Congress and suggested it plug up the holes in laws intended for a precyberspace era.

The ruling was hailed by civil libertarians but was blasted by the software industry, which promised it would seek additional legislative weapons against software piracy.

MIT student David LaMacchia escaped conviction on criminal charges that he ran an electronic bulletin board that others used to illegally upload and download more than $1 million in copyrighted software. U.S. District Court Judge Richard Stearns in Massachusetts ruled that the old federal wire fraud law under which LaMacchia was indicted was not applicable in his case.

Successful use of the wire fraud law against LaMacchia would have served to "criminalize ... the myriad of home computer users who succumb to the temptation to copy even a single software program for private use," Stearns wrote in his decision.

Harsh words

While LaMacchia escaped a fine and a federal prison term, his alleged behavior won no support from the court. "If the indictment is to be believed, one might at best describe his actions as heedlessly irresponsible and at worst nihilistic, self-indulgent and lacking in any fundamental sense of values," Stearns wrote.

He also said current copyright law could not be used against the MIT student because its criminal provisions require showing that copyright infringement was made "for purposes of commercial advantage or private financial gain," something LaMacchia was not alleged to have done.

"We would have much preferred for David LaMacchia to serve as an example of someone who was successfully prosecuted, but there will be others, and we have just begun to fight," said Robert Kruger, director of enforcement for the Business Software Alliance (BSA) in Washington. He said the BSA will go after bulletin board operators who break the law with civil lawsuits.

Kruger added that it is likely the U.S. Department of Justice will seek changes to the Copyright Act to make it easier to prosecute those who facilitate software copyright infringement without directly profiting from it.

"The LaMacchia case points out that we need a legislative fix to enable us to prosecute bulletin board operators," said Ken Wasch, executive director of the Software Publishers Association in Washington. He estimated that software piracy of all types costs vendors $7.5 billion a year worldwide and $1.5 billion in the U.S.

Wasch said the requirement in the current copyright law that infringers must benefit financially to be prosecuted is flawed. "The issue is not what the bulletin board operator gains, it's what the copyright holder loses," he said.

"The court has ... struck an important blow for the proposition that First Amendment free speech ... must be considered as the Department [of Justice] seeks to enforce its own agenda in the Age of Cyberspace," Harvey A. Silverglate, LaMacchia's attorney, wrote in a statement.

But the court's decision did not treat the case in such lofty terms. Stearns wrote, "Criminal as well as civil penalties should probably attach to willful, multiple infringements of copyrighted software, even absent a commercial motive on the part of the infringer."

U.S. Attorney Donald K. Stern said he had not decided whether to appeal the decision. LaMacchia could not be reached for comment.

Congress should fix copyright law now. See page 34.

D&B crackdown

CONTINUED FROM PAGE 1

D&B Software said it is not suggesting any customers are in the wrong. But it is nevertheless making clear that it is taking code modification very seriously and is willing to go on the offensive.

A 1994 lawsuit over this issue with Grace Consulting, Inc., a small consultancy in Upper Montclair, N.J., last week boiled over into a public dispute. Grace sent letters disputing D&B's claims to customers and the press. In the still-unsettled lawsuit, D&B Software claims that, among other violations, Grace modified D&B code well beyond a few standard tweaks, a claim Grace disputes.

D&B Software confirmed last week that it had settled a second lawsuit concerning code modification on Dec. 30. That suit was against another consultancy that D&B declined to name, but Michael McCarthy, principal of The Spectrum Group in Austin, Texas, confirmed that his company had settled its legal dispute with D&B Software. McCarthy, who said the dispute involved code modifications performed as part of its maintenance business, said his company settled rather than get involved in an expensive lawsuit. "We felt D&B would fight this tooth and nail," he said.

Spectrum agreed to no longer provide maintenance services to its 60 D&B customers, although it will continue its consulting business, McCarthy said.

Code modification is a long-standing practice by many mainframe customers because off-the-shelf applications often do not suit an individual company's needs. Most software providers, including D&B Software, have long acknowledged this and typically allow customers to tailor the software to fit their needs — with a third-party consultant, if needed.

D&B responds

In an interview last week, James Alberg, D&B Software's general counsel and a senior vice president, said those standard procedures on code modification still exist. The issue with the two consultancies, Alberg said, centered on far more extensive modifications.

In the case of Grace Consulting, D&B Software maintains that modifications were not written for an individual customer's particular requirements but "in a way that would be applicable to many customers."

Anthony Ilutzi, president of Grace Consulting, disputed that claim and said D&B Software is simply trying to prevent any competition.

Concern over code modification "is a fundamental issue that has arisen in the last four or five years," said Esther Roditti, editor of "Computer Law & Tax Report" and a lawyer in New York. "It is the issue of use. The standard agreement was that a customer could use [the software] for internal purposes only. It had not been challenged for years and years."

Grace works with approximately 50 D&B Software customers, and at least one of those users said he fears he just landed in a no-win situation. Bob Malloy, manager of systems development at the Bowman Grey School of Medicine at Wake Forrest University in Winston-Salem, N.C., said he started working with Grace nearly two years ago because D&B Software's maintenance services were "horrendous."

Malloy did not provide details on code modifications at his organization. But, he said Grace is providing higher quality service than D&B for about half the cost.

Some observers said the lawsuits — and the warning shot fired in the letter to customers last week — could all boil down to the bottom line for D&B Software.

"This is clearly a strong-arm tactic, regardless of what the law says," said Bobby Cameron, a senior analyst at Forrester Research, Inc. in Cambridge, Mass. "The guys who would eat D&B's lunch aren't Grace. It's the people like Andersen [Consulting]. So they have to look like they won't take [modification] lightly."

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NorthPoint model evaluates start-up risk

By Neal Weinberg
FRAMINGHAM, MASS.

Two weeks ago, David L. Chapman looked a young software company CEO straight in the eye and told him his start-up was failing. Chapman recommended filing for protection under Chapter 11 bankruptcy.

It is not often that Chapman has to deliver such dire news, but when he does, he is confident that it is based on solid evidence. His company, NorthPoint Software Ventures, Inc. in Framingham, Mass., has developed a sophisticated assessment model with more than 400 weighted variables that ultimately spits out a single number called the risk index.

Once the model has determined a client's overall risk level, it pinpoints specific areas of strength and weakness.

The resulting information is being used by a wide swath of clients, including start-ups seeking help with product development and strategy issues, venture capitalists seeking sound investment candidates and established vendors wanting to spin off a product line or evaluate an alliance or acquisition.

The idea, Chapman said, is to take intuition out of the process, substituting a statistical methodology based on an exhaustive historical compilation of what has proved successful at other firms.

But at least one of NorthPoint's clients will not concede that a computerized program can make better investment decisions than a savvy venture capitalist.

Michael J. Zak, general partner at Charles River Ventures, Inc. in Boston, said NorthPoint "formalizes the quantitative side of the problem but still leaves a tremendous gap where instincts are brought to bear." He said the NorthPoint model can "either validate what you came to on your own means, or it can challenge what you came to and point to certain areas to revisit."

Zak added, "I look at it not as a substitute for personal and professional analysis and judgment but as a way to augment the analytical process."

James A. Pelusi, president and chief executive officer at Fastech Integration, Inc. in Lincoln, Mass., said he likes that NorthPoint's model is statistically based.

Pelusi, whose firm develops manufacturing automation software, said NorthPoint came in and identified weaknesses in field support and product development. Fastech focused on those areas, and a year later, the firm's risk index had improved, he said.

NorthPoint consulting projects

Client	Advice
Fastech Integration, Inc., Lincoln, Mass.	Pointed out weaknesses in field support and product development
IBM Bethesda, Md.	Helped identify risks in sales force automation business
Charles River Ventures, Inc. Boston	Provided second opinion on decision to fund a start-up

With 36 years' experience in the computer business, Chapman launched NorthPoint in 1992 to tackle the question of why so many software start-ups fail. He had been an engineer at IBM, a senior vice president at Data General Corp., president and CEO at Cullinet Software, Inc., president of a professional services company and a general partner in a venture capital firm.

After analyzing successful and unsuccessful companies, Chapman has concluded that technology problems sink only about 12% of software start-ups. Marketing and management woes account for the vast majority of failures, he said.

Chapman took the results of that research and put together the statistical model that reportedly helps predict whether or not a company will fail.

The idea is not to eliminate risk altogether. Risk is a virtue in the software industry, Chapman said. The trick is to turn that risk "into economic value."

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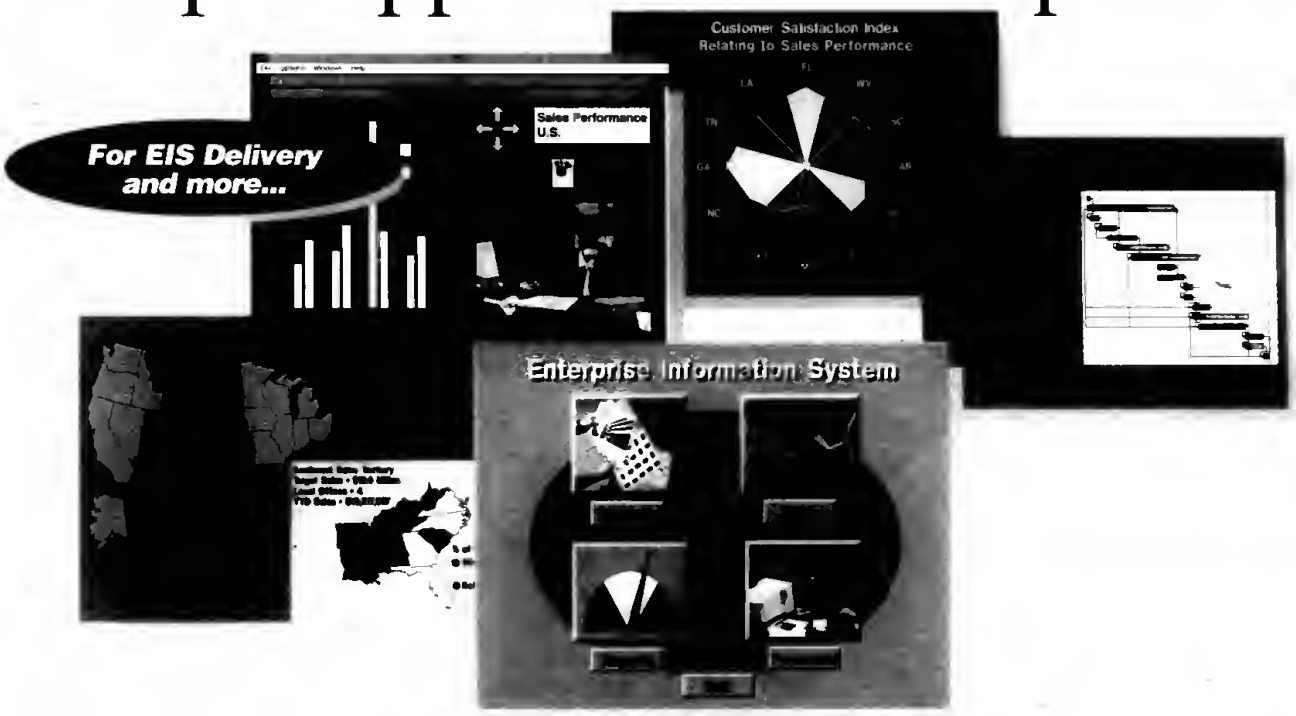

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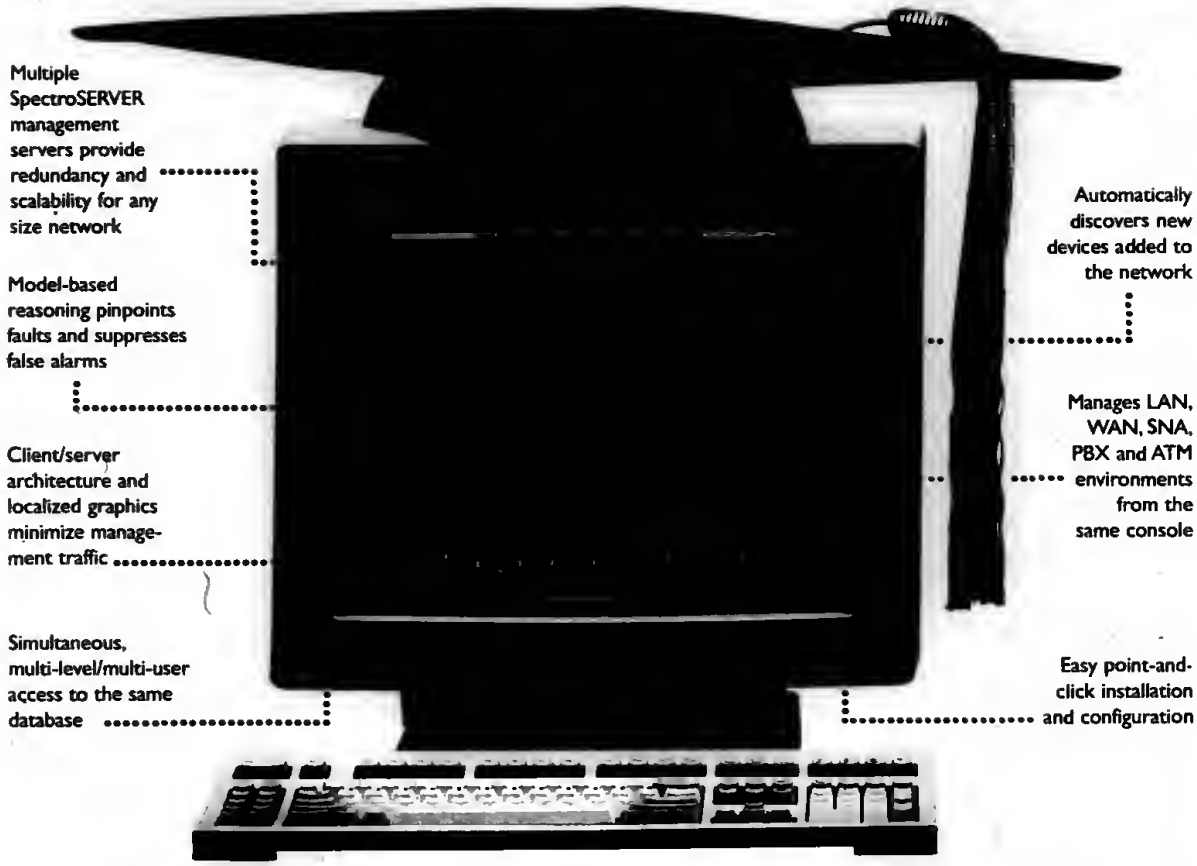

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Industry celebrates accounting rule victory

By Gary H. Anthes

Silicon Valley got a huge Christmas present recently when the Financial Accounting Standards Board (FASB) scrapped a plan to require companies to deduct from earnings the value of stock options given to employees.

But Santa Claus kept in his bag an item that has now moved to the top of the wish list for high-tech firms — namely some sort of curb on frivolous shareholder lawsuits (see box below).

Computer companies fought the FASB plan for two years, claiming it would curtail the use of options and thus inhibit their ability to attract the best talent to risky ventures. They also said it would reduce the market value of their publicly traded firms, making it harder to attract investment capital.

CEO Eric Benhamou: *The proposal would have cut 3Com's earnings 40% to 50%*

Part of the impetus for the FASB proposal came from public criticism that keeping the cost of stock options off the books amounts to "stealth" compensation for overpaid senior executives. However, 50 computer and biotechnology firms, represented by The Coalition for American Equity Expansion (CAEE), challenged the perception that stock options are reserved mostly for executives with six- and seven-figure incomes.

For example, CAEE member 3Com Corp. said it extends its stock option plan to every employee. The FASB proposal would have cut 3Com's earnings by 40% to 50% and "severely reduced" the market value of the company, said Eric Benhamou, president and chief executive officer.

Instead of deducting from earnings an estimated value of stock options at the time they are granted, the FASB now says firms may simply disclose that in a footnote to published financial statements.

But the Norwalk, Conn.-based rule-making body has not yet said just how the value of options will be determined, which in itself is a matter of great complexity and controversy.

Ken Hagerty, CAEE director, said he had been assured by Securities and Exchange Commission Chairman Arthur Levitt Jr. that FASB will ultimately allow firms to report a range of values rather than more difficult point estimates.

At Xilinx, Inc., a San Jose, Calif., maker of software and semiconductors, Bernard V. Vonderschmitt, president and CEO, is still concerned about footnote disclosure of stock options.

Depending on the degree of specificity ultimately demanded by the FASB, analysts, portfolio managers and venture capitalists may simply create their own financial statements, deducting from earnings option values found in footnotes, he said.

Litigious society

Having slain the FASB stock option dragon, Silicon Valley firms say abusive shareholder lawsuits have become their No. 1 bete noire.

"That's clearly the top concern now," said Bernard V. Vonderschmitt, president and CEO of Xilinx. "Very few of these [lawsuits] are taken to trial because the potential liability is so great no company will take the chance. It amounts to virtual blackmail."

He said the threat of lawsuits also makes executives afraid to give out even the most conservative financial projections, thereby robbing the investment community of the information it needs to make informed judgments.

—Gary H. Anthes

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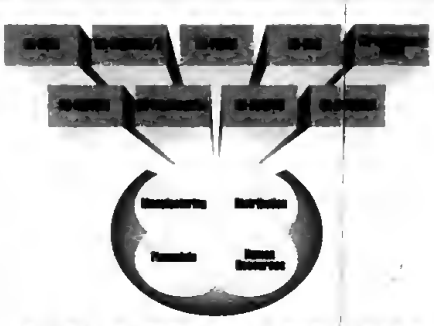

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Multimedia takes stand at Simpson trial

Video viewing system to display 10,000 pieces of evidence for jurors

By Mitch Betts

Jurors in the Los Angeles murder trial of O. J. Simpson should have no trouble seeing the evidence — all 10,000 pieces of it. A computerized "evidence presentation system" will display documents, photographs, charts and video clips on a 67-in. screen.

The $200,000 multimedia system is one of the first ever used in a criminal trial. But smaller systems are already cropping up in civil proceedings as lawyers strive to help jurors visualize everything from complicated patent and copyright issues to car accidents and product liability claims.

Jurors will get a wide-screen view *of the evidence in the murder trial of O. J. Simpson on Electrohome's big-screen projector*

In the Simpson case, Judge Lance Ito requested the system for his courtroom to provide both sides with instant access to the thousands of pieces of evidence. The jury and audience will see the evidence as big-screen projections, while the judge, lawyers and witnesses will be able to view it separately on 15-inch computer monitors.

Technicians will be present to zoom in on particular pieces of evidence, such as documents. They will also be able to "blank out" the projectors so that jurors cannot see a particular piece of evidence until the judge decides on its admissibility.

The system integrator is Trial Presentations Technologies in Los Angeles, which is donating the system for marketing reasons during the highly publicized trial, said Thomas Reiter, director of technology at the consultancy.

The system is powered by a Dell Computer Corp. Optiplex 486-based PC, with a video card for digitizing the video clips and multimedia software from Optical Magnetic Imaging Corp. in Woodland Hills, Calif. The big-screen projector is from Electrohome Ltd. in Kitchener, Ontario.

Two-way street

The main reason for using multimedia is to enhance jurors' understanding and retention of complicated evidence. The systems also help to keep the judge and jury interested and entertained during a lengthy trial, said James W. McElhaney, professor of trial practice and advocacy at the Case Western Reserve University School of Law in Cleveland.

Yet there is a risk that high-tech presentations can backfire if they are overused or used poorly. "The wonderful show can turn into a wonderful mess if there are technical gremlins or if the lawyer shows ineptitude and can't make it go," McElhaney said.

Lawyers also must ensure that any computer animation used for reenactments is unbiased and accurate. "Cooked evidence may be exposed for its unfairness and destroy the lawyer's credibility," McElhaney said.

More to come

Competitors in the emerging field of multimedia legal presentation also include Decision Quest, Inc. in Torrance, Calif., and Litigation Sciences, Inc. in Culver City, Calif.

In the Simpson case, the fact that both the prosecution and defense can use the high-tech system is important. Experts said a multimedia system provides a competitive advantage if only one side has it.

For example, a multimedia presentation was recently credited with helping Litton Industries, Inc. win a $1.2 billion patent infringement case against Honeywell, Inc.

Similarly, a multimedia presentation helped Michael Jackson and other recording artists successfully defend against a $20 million lawsuit charging that they plagiarized songs such as "We Are the World" and "Thriller." A computer system developed by R. Scott Cowdrey at Litigation Graphics & Design in Moscow, Idaho, showed that the note sequences in question had been in common usage for more than 40 years.

Boston user group aims for comeback

By Ed Scannell

■ Struggling to reverse the steady decline in its membership and reestablish tighter connections with users, the Boston Computer Society (BCS) recently appointed an executive director who plans to renovate its programs and services.

"This is not a home brew club anymore. Our users have grown up," said Pam Bybell, 33, elected last month as executive director of the BCS. She is the fourth person to lead the organization in four years.

"A lot of the [industry] was passing us by," Bybell added.

The Internet, for example, is one key area where the BCS has failed to keep abreast of member interests. The organization has offered little in the way of courses and training and only recently posted its own home page on the Internet — something other major user groups have had for some time.

BCS Executive Director Pam Bybell *plans to boost the group's flagging reputation with user services*

While plans are still uncertain, Bybell said she and the board are discussing the possibility of making services such as discussion groups and even a publication available over the Internet. A blend of technical, organizational and marketing skills are needed to make a group like the BCS more competitive in the 1990s, Bybell added.

The BCS has "always done well when new platforms or ideas were emerging and [as a place] where people wanted to get together to trade information," said Jeffrey Tarter, editor of "Soft Letter," a newsletter in Watertown, Mass. "They need to get back to that."

The organization also plans to more aggressively pursue corporate users — yet another departure from the past. One notion is to offer bulk memberships and tailored products and services, such as Internet training, that meet a company's specific needs, according to Bybell.

Bybell's appointment caps months of debate about the kind of leadership the organization now requires. Earlier this year, the BCS failed to renew the contract of former director Bob Grenoble, who was widely criticized within the organization for his lack of enthusiasm for promoting technology.

"Bob was quoted saying he preferred using paper and pen to a program like Quicken to do his finances," Bybell said. "A certain segment of the membership thought that was bad PR for the head of the BCS."

> "This is not a home brew club anymore. Our users have grown up."
>
> *—Pam Bybell, BCS executive director*

Downward drift

Since 1989, membership in BCS has dropped from 32,000 to 24,000, eroding the group's profitability. It has operated in the red since 1990 — with deficits running as high as $200,000 annually — after 13 years of rocketing growth and profitability. The current fiscal year budget is $1.3 million, Bybell said.

Some observers noted that the BCS has also drifted away from industry organizations such as The Association of PC Users Group, which may have also contributed to BCS losing touch with industry trends.

"The BCS has withdrawn itself somewhat from the world community of user groups and is sort of out there by itself," said Jerry Schneider, a consultant in Burke, Va., and one of the association's founders. "They don't do a lot with other user groups."

Schneider added that the BCS's plummet in membership is unique among other association members, whose user enrollments have remained steady or increased in recent years.

Many of BCS's problems may have begun with the departure of Jonathan Rotenberg in 1990. The group's well-known founder served as visionary and day-to-day administrator since the group's inception in 1977.

Bybell and others now say Rotenberg was perhaps allowed to run too much of the operation. "Part of the problem was [Rotenberg] was doing too much, and the people taking over didn't have his experience in searching out new members," Bybell explained.

Both Schneider and Rotenberg were instrumental in forming the New York-based Association of PC User Groups (APCUG) several years ago, a group that now represents 400 individual user groups from around the world. The BCS, however, is no longer a member of APCUG.

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Briefs

Kendall Square falls

Kendall Square Research Corp. last week filed for bankruptcy protection under Chapter 11. The struggling company also announced that William Koch, its largest shareholder, resigned as chairman of the board.

Viewlogic at a loss

Viewlogic Systems, Inc. plans to report lower revenue and earnings than expected for the fourth quarter ended December 1994. Although the company saw continued strength in its point tool products, it attributed the shortfall to weak demand for its schematic entry design products. Definitive results will be posted in the last week of January.

SHL streamlines

As part of a cost-cutting move, SHL Systemhouse, Inc. last week said it had restructured, establishing operating units along the company's three lines of businesses. Heading up the units were Richard H. Beatty at Systems Integration and Transformational Services; E. Victor Oliver at Technology Deployment and Educational Services; and Dennis B. Maloney at Systems Operations and Outsourcing Services.

SHORT TAKES A California Supreme Court made Advanced Micro Devices, Inc.'s breathing a bit easier by ruling that AMD had the right to clone Intel Corp.'s 80386 chip. Intel may appeal to the U.S. Supreme Court. ... Gentcom Corp. has executed letters of intent to acquire Printer Systems Corp. and Harris Adacom Network Services, Inc. ... Media Vision has gained a $15 million secured line of credit after emerging from bankruptcy in December. ... R. R. Donnelley & Sons Co. bought the manufacturing assets of Novell, Inc.'s disk replication and assembly facility.

Unisys readies pink slips

4,000 jobs will be cut as company alters direction

By Julia King

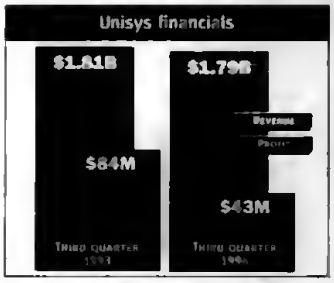
An ongoing quest to reinvent itself as a cost-efficient information services company led Unisys Corp. to close out 1994 with plans to cut 4,000 jobs, primarily in its mainframe manufacturing and maintenance divisions.

The 4,000 employees will be laid off during the next 30 to 60 days. The company also announced it would take a onetime, pretax charge of $175 million to $225 million in the fourth quarter, which ended Dec. 31, 1994. Unisys' full year-end financial report is scheduled for release on Jan. 23.

At the same time, the Blue Bell, Pa.-based company will continue adding personnel to its worldwide information services unit, which grew by more than 22% in the first nine months of last year — making it Unisys' strongest and fastest-growing market segment. Over a two-year period, Unisys will have hired 2,000 information services employees. After all the additions and subtractions, the company projects its workforce will total about 42,900 people by the end of 1995.

In addition to information services, Unisys' nongovernment business is also growing at an annual rate of roughly 38%.

All three moves, analysts said, are key to Unisys' transformation strategy, which has been on a fairly steady course under the direction of Chairman James A. Unruh. He joined the mainframe manufacturer in 1990, one year after it reported a first-ever loss of more than $700 million.



Under Unruh, Unisys cut 16,000 jobs in 1991. A year later, the company hired Victor E. Millars, a founder of Andersen Consulting, to build Unisys' budding information services practice, the brainchild of Unruh. In 1994 alone, Millars brought in about 100 information services consultants, many of whom were lured away from competitors.

Against this backdrop, the most recent round of job cuts represents just "another business-as-usual move in that Unisys continues to adjust its skill sets to retain a competitive posture in the marketplace," said Robert G. Simko, director of International Technology Group in Mountain View, Calif.

"They have to do it," added Jim Johnson, chairman of The Standish Group International, Inc., a Dennis, Mass.-based consultancy. "We see all companies like IBM and Unisys having to refocus and reskill. It's not a question of why but when."

Across the board

Last week, a Unisys spokesman in Blue Bell said the job cuts will be "widely scattered" across the company's worldwide operations.

"With common platforms, we're able to use the same cabinetry and I/O across the A series, 2200 series and Unix boxes, which means we can leverage the R&D function," he said.

Cuts are expected to be particularly heavy in Europe, where customers' faster-than-expected transition to client/server computing has driven down mainframe demand and taken a heavy toll on profits.

"The margins with client/server aren't nearly as good as with mainframes," the spokesman said. "That's one of the biggest reasons we have to change our cost structure."

Former AT&T GIS chief prepares to rebuild Legent

By Neal Weinberg

Customer focus will be the top priority for Jerre L. Stead, who has taken the helm at software underachiever Legent Corp.

Stead, who announced his exit last week from AT&T Global Information Solutions, where he was chief executive officer, said he plans to spend three days a week on the road meeting with Legent customers.

Legent's Jerre L. Stead *has a reputation as a fix-it man*

Legent, a $500 million company in Herndon, Va., has set its sights on becoming a multibillion-dollar operation in short order. To meet that goal, Stead will implement a customer-focused business model, a strategy that appears to have worked for him at AT&T GIS.

During his 20-month reign at AT&T GIS, Stead conducted a major reorganization, said David Card, director of systems research at International Data Corp. in Mountain View, Calif. "Sales, marketing and engineering were all organized and dedicated around key customer accounts," Card said.

The 51-year-old Stead said he moved from a $7.3 billion unit of AT&T Corp. to the much smaller software company because "it's something I always wanted to do — take a [relatively] young company and mold it into a great company."

Stead's challenge, according to analysts, is to bring cohesion, higher visibility, stronger marketing and a unified product line to a company patched together through mergers and acquisitions.

"He's a fix-it guy, a turnaround guy," said David Benhaim, an analyst at First Albany Corp. in Boston.

Benhaim said his view is that Legent has "visionary products," especially its Cross Platform Environment, which is a framework for distributed enterprise computing. But the firm has not developed the organizational and marketing skills needed to build the type of momentum wielded by competitor Computer Associates International, Inc.

"The issue at Legent is to take a niche player that has been in the mainframe software business and move it into the outsourcing of client/server computer applications," said Berge Ayvazian, an analyst at The Yankee Group in Boston. "Jerre Stead is just the kind of executive needed at the helm."

Ever since Legent President and CEO John Burton announced his plans to leave the company in August, Legent stock has drifted downward and takeover rumors have circulated.

Open to alliances

Board Chairman Joe Henson, who will retire next month, allowing Stead to take his seat, said Stead's hiring should lay the takeover talk to rest. Stead's compensation package, heavy on stock options tied to future growth, also speaks of the company's desire to remain independent.

That does not mean that Legent will not be active in forging alliances with other companies. "Legent could benefit through alliances and links to other companies," Ayvazian said. "And that's one of the things Stead can do rather effectively."

On the other side of the equation, AT&T has named William T. O'Shea, senior vice president of worldwide marketing, to an interim post while it searches for Stead's replacement.

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A crime that pays

Let's suppose I advertise, through various means, a service for thieves. I will appear at the back door of, say, a sporting goods store at midnight. I'll bypass alarms and hold the door open, and anyone responding to my solicitation is free to walk in and take what he wants.

I don't profit from this. I am motivated by the belief that some capitalist pig created the goods therein, and thus they should be free to the people.

Only the lunatic fringe would say I wouldn't be committing a crime. But this is pretty much what an MIT student is alleged to have done in allowing thieves to cart away more than $1 million worth of software, free of charge. Instead of standing at the door, David LaMacchia posted the software on a bulletin board and exhorted anyone to copy it. He knew it was wrong and tried to cover his tracks. He got caught.

Now mix in a silver-tongued lawyer, a Clinton-appointed prosecutor, a job-for-life federal judge and most of all, federal wiretap laws drafted before anyone reading this was born. Voila! LaMacchia is walked.

With luck, this sorry episode will serve as one more reminder to the new and improved 104th U.S. Congress that business needs the protection of copyright laws revised to fit the times. Imagine the chilling effect on would-be software pirates of a $200,000 fine and a few years behind bars for Mr. LaMacchia. Hey, we're talking about the assisted theft of more than a million dollars' worth of goods.

Instead, the judge said, "He didn't do anything illegal." That ruling sets a precedent to exonerate the next person who holds open the back door.

Make no mistake about it. There will be a next time and a time after that. And each will cost you money, as someone somewhere takes something without paying for it. Let your congressperson know the time is long past for the creation of laws to govern clearly illicit activity in cyberspace.

How good are you?

Since we published our *Premier 100* issue in September, many readers have asked how their companies stack up against those we selected as the most effective users of information systems. Well, now you can find out. If your company has more than 100 employees, you can fill out a questionnaire and we'll send you a free report showing how you compare with the Premier 100 averages. We retain the right to use the information you provide us for editorial purposes, but individual statistics won't be published. If you're interested, send a request on company letterhead to Paul Gillin, Editor, Computerworld, 375 Cochituate Road, Framingham, MA 01701 or send an electronic-mail request with your address and phone number to survey@cw.com.

Bill Laberis

Bill Laberis, Editor in Chief
internet: *blaberis@cw.com*

Flame mail targets: Put out the fire

Responding to an honest question with a flame letter is a form of cruelty ["Flame mail burns users," CW, Dec. 5]. I have been on the receiving end of sarcasm, and I know how it made me feel. If flaming is done in person, the look on the flamee's face usually draws an immediate apology from the flamer. Unfortunately, the impersonal 'net keeps the flamer from seeing the effects of his or her message.

I like to think that the person writing the offending message will someday be applying for a position and the personnel director will be a flamee with a very long memory. You never know when you'll need a favor.

George W. Ball
Alfred, N.Y.

I am a marketing manager for a software vendor, so I use electronic mail frequently for communication, both internally and externally. I received my first flame mail letter when I accidentally sent a message to an entire user group asking to be added to the subscriber list. Most users ignored this mistake, but one participant sent a flame message that made my hands shake.

The flame message was demeaning, insulting and cruel. What was I, an idiot woman, doing on the Internet? Who was I to try to access this male-dominated dominion? Didn't I know the basic rules of this world? What could I add to the user group when I couldn't even subscribe correctly? And on and on

The whole experience so disgusted me that I never did get onto the user list (our company is a member of this organization), and when someone nicely responded with the correct information on how to subscribe, I was afraid to read the message. Later I learned that this was only a mild flame as flames go and that flaming is "part of the Internet experience." Sorry — it's not a part that I want to share.

Jennifer Hart
San Francisco

I used to get offended by [flame mail], but I got some great advice from a buddy, a Houston police officer with about 12 years of experience dealing with obnoxious people: When one resorts to name-calling and personal attacks, it's because he's run out of intelligent arguments and knows it.

The next time you get flamed, sit back and smile smugly: You won.

Ray LaFrance
Golden, Colo.

Many years ago, one of my friends wrote a paper for a sociology class on what is now in some circles called "keyboard lycanthropy."

He suggested that the root of this behavior lay in the poor bandwidth of the medium. E-mail lacks the stabilizing force of personal presence and the come-back-to-haunt-you character of the written letter. Consequently, people write things in newsgroups and E-mail that would result in their being punched out, sned or disowned by their parents if they had said it face-to-face.

These individuals are often charming enough in person; they exhibit sociopathic traits in computer-mediated communication simply because cultural forms lag behind technological trends. For many people, the mores and practices of culture are the only factors regulating their behavior. One need not be capable of independent ethical reasoning, or even common sense, to use a computer.

For that reason, I fear your call for ostracism of flamers is noble but unlikely to be heard.

Patty A. Hardy
Emeryville, Calif.

That's life

I guess cyberspace is just like the real world: A few bad apples — virus writers, hate groups, criminals of all sorts — make life miserable for all. The hard-core bullies won't change, but perhaps your opinion pieces will help those on the fence not to get drawn into the negative and destructive. We can be part of the solution rather than part of the problem.

David K. Tao
West Chester, Pa.

More letters, *page 38*

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IBM, is that you?

Elaine Schmerbeck

I recently attended a seminar sponsored by IBM's marketing group, which announced the release of a software product for PCs. I won't get into the technical hoopla of the product, although there was quite a bit of it.

What amazed me more than the technical wonders of the product was the way IBM presented it — more specifically, the way the presenters looked. They wore golf shirts. What was even more startling was that the shirts weren't white. They were bright — magenta, turquoise and fuchsia. Where were the blue suits with white shirts and power ties that IBM made popular for all those decades? And, these people were young. Yuppies! I could hear their BMWs humming in the parking lot. By the way, this seminar was held at one of the nicer local resorts. I'm impressed, IBM.

Just like a piece of its software, IBM has presented different versions of itself.

More than 200 participants — we were the customers, the drab ones — witnessed this metamorphosis. From the jazzy 10-minute film introducing the product to the obvious jabs taken at Microsoft, I kept wondering if I was at the right event.

IBM, what happened? I mean, I like the change, but what brought this on?

Just like a piece of its software, IBM has presented different versions of itself.

IBM Version 1.0: Founded in the early 1900s and known as Big Blue, IBM was the epitome of the corporate world. Considered the leader in information technology, it was also one of the world's most efficient manufacturers. The skills and dedication of its employees were phenomenal. White shirts and suits were everywhere.

IBM Version 2.0: The company invested in outdated technology and strangled itself in bureaucracy. While busily losing $2.8 billion in 1991, $5 billion in 1992 and $8 billion in 1993, IBM missed opportunities that its competitors, including Microsoft, ran with. As Microsoft and Bill Gates gained power, IBM's dress code didn't mean much anymore.

IBM Version 3.0: Two words describe this version — Louis Gerstner. He seems to be running IBM as successfully as he did RJR Nabisco and American Express. Under Gerstner, IBM wins applause for reducing costs, redirecting the sales force and encouraging a more customer-driven perspective. Profits are back.

But Gerstner realizes his job isn't complete, and he's letting his employees know it. That was shown by Gerstner's electronic memo to employees that warned them not to sit back and hum "Happy Days Are Here Again." Rather, he said they have to focus intensely on eliminating unnecessary costs and bureaucracy and implementing IBM's business strategies.

IBM is still being watched by wary analysts and consumers, and its strategy may not always be clear. It will be interesting to see where this leads the company. But you'll surely be able to find them wherever they go, especially in those magenta golf shirts.

Schmerbeck is a senior systems analyst for the city of Phoenix.

E-mail is only one path to success

Paul A. Strassmann

If you believe what you read, there are anywhere from 5 million to 22 million people pecking away on keyboards and passing messages back and forth. According to the pundits, we are witnessing a change in habits not seen since the abandonment of the horse for the automobile.

Yet nobody knows the extent to which E-mail is used to perform useful business tasks. To make a judgment about the importance of E-mail to business we must get reasonably good facts. Luckily, the editors of *Computerworld* posed questions about E-mail to the candidates for the *1994 Premier 100* list of the most effective users of information technology [CW, Sept. 19, 1994].

Only 40% of the employees of the Premier 100 firms have computers, and only a fraction of those are connected to a network. Of those connected, 75.5% have E-mail available for internal communications. The combination of these factors gives you the revelation that only 18% of the employees at Premier 100 firms have E-mail on their computers. That statistic still does not reveal how many actually use it, but it tells you that even highly productive organizations have enormous potential for exploring E-mail as a communications means.

Proponents of the information superhighway do not pay much attention to internal communications because they are more interested in intercompany electronic sharing of information. It just so happens that the Premier 100 survey also included the question "How many desktops/laptops have access to customers or suppliers?" The answer was a disappointing median of 5%, which accounts for little electronic commerce.

In addition, I have found no correlation whatsoever between the extent of E-mail availability and the information productivity of firms, as measured by the ratio of economic value-added/estimated total cost of information. As a matter of fact, three of the Top 10 most productive firms in the Premier 100 hardly use E-mail; five of the 10 most productive firms have E-mail installed on PCs operated by more than 90% of their employees. That may be tied to the tendency of smaller firms to rely less on E-mail because everybody meets for coffee to swap all the news that matters.

Only 18% of the employees at Premier 100 firms have E-mail on their computers.

The median Premier 100 company has $2.6 billion in sales, employs 10,224 people and has 3,880 desktop or laptop computers. It is slightly larger than the median for all Fortune 1,000 corporations. This means we have a representative sample of the characteristics of U.S. corporations that use not only E-mail, but also mainframes and microcomputers, and their software expenditures. I ran a test to see if the larger companies rely on E-mail communications more than the smaller ones. To my surprise, they didn't. Plotting employment against E-mail use revealed no pattern favoring companies with large numbers of employees. The only variable that correlated was mainframe usage: Companies providing remote access to databases also make extensive use of E-mail.

What are the implications of this? First, do not switch to E-mail with the expectation that the information productivity of your firm will automatically increase. Second, before you commit to the currently fashionable superhighway of electronic commerce campaigns, make sure you fully understand what the specific effects on your company's measurable productivity performance will be. Third, view E-mail as part of a much larger package of how your people share information, rather than as an isolated application.

Strassmann is a consultant in New Canaan, Conn., and author of *The Business Value of Computers* (1990) and *The Politics of Information Management* (1994).

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The war is over. No more howitzer shells

coming at client/server groups from the glass house. No more client/server people lobbing grenades at the MIS staff. Not that peace is always as peaceful as you'd like it to be. Networks going down, bottlenecks popping up, people screaming about applications they can't get to. And a nasty feeling that nobody is really doing anything to help you with any of it. When, in reality, all of us at Legent are doing quite a lot. We've put together the most extensive set of industrial-strength, distributed systems management tools available. We've also developed an open architecture called XPE™ that lets our software work together across almost anything you can wire together, regardless of function or platform, from mainframes to UNIX servers to PC LANs. Which means you can manage your systems from the platform of your choice, something our customers tell us they're happily doing right now. It's not a silver bullet, but it can definitely help you do your job better. Besides, it's peacetime. Who needs bullets?

America Online users feel the heat

You are right about the "cyberracism" against users of America Online ["Flame mail burns users," CW, Dec. 5]. If you have "aol.com" appended to your address, you are instantly labeled a Johnny-come-lately techno-illiterate.

Thanks for the great article.

Jay Stevens
Kennesaw, Ga.

I am saddened to see neophyte AOL users abused on newsgroups because of their site name. My sister, sister-in-law and aunt all use AOL. They're intelligent, sensitive people who can hold their own against these idiots, but I fear they will be put off by mean-spirited electronic mail

Could we liken these people to drunk drivers on the information superhyperway?

Ry Jones
Kirkland, Wash.

I have a suspicion that the majority of flamers are neophytes themselves, flaming because it seems the best way to appear to be a longtime user.

Also, I must cast some of the blame for the flaming problem on those in charge of services such as AOL. If AOL had been paying attention, it could have turned the problem around with things such as improved user training and better tools. And CompuServe has a warning memo that smacks of "Here's your darn Usenet. Now stop your whining! We hereby wash our hands of the mess you are about to get yourself into."

New users are hungry to find out how to get the most out of the wonderful Internet they have heard so much about. Throw them a 20K-byte frequently-asked-questions document to read, and they will promptly ignore it and go in blind. Throw them a dramatic multimedia presentation with a liberal dose of humor, and they will go in prepared.

Al Hunt
Fort Saskatchewan, Alberta

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Flame mail can serve a purpose

I will admit to having flamed my share of the AOL newcomers you mentioned. But my flame messages were caused by their total lack of 'netiquette.

Some of my favorite newsgroups have become virtually unbearable because of spamming, excessive quoting and totally worthless messages. I can handle opinions even when I don't agree with them, but people who have no sense of 'netiquette need to be educated.

Unfortunately, the only real vehicle we have for policing the 'net is peer pressure. And one of the few ways we can assert that is by flaming. Granted, it might be nicer to politely explain why cross-posting to 15 newsgroups isn't acceptable, but flamers are people whose tolerance threshold has been exceeded. When someone is talking in a movie theater, I tell him to shut up; I don't have a five-minute discussion about why I would prefer that he please refrain from talking.

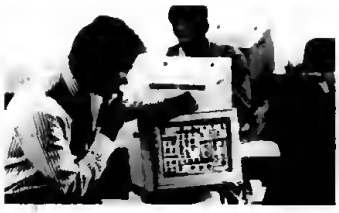
Gordon R. Meyer
Des Plaines, Ill.

Freshman class is the real threat

I cannot say you are completely in touch on the subject of America Online bashing. AOL has been under attack for some time. Most of this bashing has died down.

Right now, it is AOLers bashing CompuServe bashing Prodigy, each promising that the other is the end of the 'net as we now know it. The true end of the 'net as we know it comes every fall, when a new, high-strung, wide-eyed, clueless, "Gee I gotta have the latest doodad, can't spell, don't pick on me" freshman class takes to their new 'net accounts.

Jerry Daniels
Richmond, Va.



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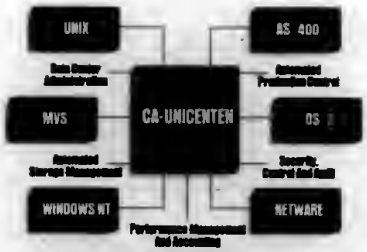

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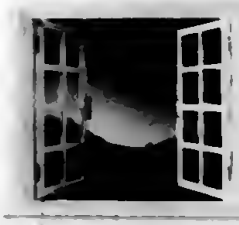

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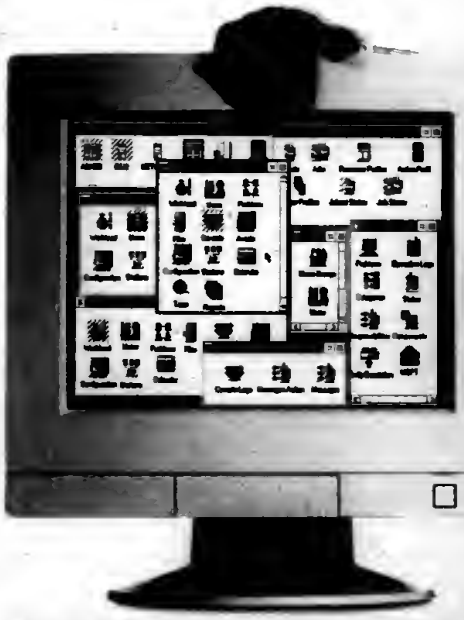

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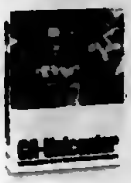

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Sales forces warm to notebook possibilities

By Michael Fitzgerald

■ Today, even as 500 vendors and widely varied tools crowd the sales force automation market, many user corporations are finding their way through the fray.

Companies such as Metro-Goldwyn Mayer, Inc., Armstrong World Industries, Inc. and John Hancock Financial Services are trying combinations of off-the-shelf and homegrown packages to give sales representatives added capabilities. Here are their stories about their efforts at sales automation, a market with revenue of somewhere between $160 million and $1 billion annually, according to analysts.

At Metro-Goldwyn-Mayer, Edward N. Altman is starting from scratch to automate his sales force. Altman, MGM's vice president of MIS, said he would rather buy tools than build them, but "I'm not aware of any laptop sales tools specific to the entertainment industry."

He said developing his own software could work to MGM's advantage in two ways. First, it could provide a competitive boon for the company because, Altman claimed, rival studios have yet to automate. Second, it could generate revenue. Altman said he intends to sell his package, preferably through an integrator such as Andersen Consulting to avoid support costs.

Revenue would go into a research and development fund for MGM's information systems department. Altman credited his boss, MGM general corporate executive Mike Hope, with giving him the flexibility to pursue the project.

In March, Altman will give MGM's 20-person global sales force IBM PC Co. ThinkPad 755CDs, which come with a built-in CD-ROM drive (see story page 42). The CD-ROM drive is a major plus for MGM because sales representatives will gain the ability to show 15- to 20-second clips of MGM movies during sales calls.

The basic application is in Powersoft Corp.'s PowerBuilder and uses PowerBuilder's Watcom SQL database, which will contain the film library for the rep's entire territory.

Supply issues mean Altman's project will be delayed six to eight weeks, but he said it will be worth the wait to gain the integrated CD-ROM capabilities.

Second time around

At Armstrong World Industries in Lancaster, Pa., the memory of a failed sales force automation project is driving a new effort that integrates several products [CW, Nov. 28, 1994].

"This time we brought in a team of reps and really looked at their job descriptions, their process, and tried to find software that fit the process and would help them do their jobs," said James A. Wellendorf, general manager of IS and technology at the $600 million building products division of the diversified materials maker. Wellendorf said the input makes the project look almost guaranteed for success.

Armstrong's James Wellendorf *says sales force input should almost guarantee his project's success*

Driving Wellendorf's optimism is the integration of a standard construction industry database into the application. The database, called the Dodge Data Line, tracks construction projects throughout the U.S. It will alert sales reps to projects in their area and help them follow the various stages, such as the naming of a general contractor.

MGM's Edward Altman *awaits built-in CD-ROM drives*

"The reps didn't see an advantage for them the first time; they put in data and didn't get anything back," Wellendorf said. "Now, with the combination of this job follow-up software and the electronic network, a Notes database and Dodge Data Line, it's a really powerful tool that, if used effectively, should increase their productivity."

The rollout, slated for Feb. 6, will involve giving each of the 100 reps ThinkPads with Aurum Software, Inc.'s SalesTrak package, Lotus Development Corp.'s Notes and Microsoft Corp.'s Office. Cellular modem capabilities will be built into the notebooks, although Wellendorf said he does not anticipate using this feature until cellular rates drop, probably sometime in 1996.

SalesTrak is not everything Wellendorf dreamed of, but it was the best fit of some 38 software packages the company examined. Aurum beat out Bedford Associates, whose product required more "assembly" than Aurum's off-the-shelf package.

"We subscribe to Gartner Group's service, and they said that [the totally integrated solution] we were looking for wouldn't exist until the year 2000," Wellendorf said.

Insurance program

At John Hancock Financial Services in Boston, a division of the large insurer, the managed care sales force is becoming automated in an off-the-shelf fashion. It has been given Intel Corp. 1486-based notebooks loaded with Saratoga Systems, Inc.'s SPS for Windows.

The fast-paced project was completed in six months, said Don Paiva, John Hancock Financial Services' director of information services. Paiva said he decided not to go with any specific brand of notebook hardware and avoided certain models entirely because of "shaky delivery schedules" that might have caused the project to miss its deadline.

The company's goal was "to improve the quality of the prospect.... We're investing quite a bit on the prospecting effort," he said.

John Hancock's sales reps can spend months or even years dealing with certain customers. The new software should give them a more efficient way to track customer attitudes and business preferences, as well as an easy way to update information on the various programs John Hancock offers.

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NOKIA MONITORS

Battery life shines in Dell's Latitude

By Michael Fitzgerald and Paul Gillin

We have seen the future, and it is lithium.

No, we are not talking about antidepressants. We mean a new technology in notebook computers. We spent several months on the road and at home using Dell Computer Corp.'s Latitude XP color notebook and developed a strong affection for the machine.

The reason for our fondness? The battery life. The acid test of any notebook computer is its ability to make a transcontinental flight without conking out somewhere over Kansas City. The Latitude XP is the Charles Lindbergh of its class. It makes the trip with power to spare. What's more, the lithium ion battery charges up in a jiffy. It took about two hours to completely restore a drained battery for another six hours' worth of work. And lithium ion batteries do not suffer the annoying "memory" problems that sap nickel cadmium batteries of their full power after a few uses.

We tested the Latitude XP with both active-matrix and passive-matrix color screens. The brightness, even when turned down to reduce power consumption, is ample for most indoor environments. In fact, even the passive-matrix color screen was clear and readable at full power in a fairly bright room.

Trackball test

The integrated Apple Computer, Inc. PowerBook-like trackball sits conveniently under your thumbs, making it comfortable to use even while your fingers are still on the home typing row. The recessed, oversized buttons and built-in hand rest are a plus. One of us hates trackball pointers (the other uses a KeyTronic Corp. TrakMate-PC wrist rest and trackball with his desktop), but the Latitude trackball is designed well enough to melt even his resolve.

The keyboard is solid and usable, and the price is outstanding for a notebook of this class. It starts at $3,199 for a base model and tops out at $5,099.

Dell publishes a complete roster of the 150-plus PC Cards that work in the Latitude. But much more important to us was that our Megahertz Corp. modems ran in the machines with no problems.

Overall, Dell did a good job with the small details. For instance, the battery status gauge, an icon that tells you how much battery life is left, is always on display at the bottom of the screen. This sounds nondescript, but many notebooks do not offer it. It would still be nice to have estimated life left in terms of hours and minutes, though.

Switch matters

Another minor annoyance is the on/off switch, which sits on the back left side of the casing, where the user could potentially turn the machine off while moving it around. But unlike some other portables on the market, the on/off switch is not a button that can be accidentally pushed. Rather, it must be pulled toward the user, which makes it more difficult to turn off the machine accidentally.

But these are minor points. Dell hit all the bases in style for a notebook that will not be used for full-motion video multimedia presentations.

The system comes with Microsoft Corp.'s MS-DOS and Windows for Workgroups 3.11. It also has a series of utilities from Dell and third-party vendors. Also included are Traveling Software, Inc.'s CommWorks for Windows, Radio Mail, America Online and Radio Express paging software and AutoMap, a route-planning database that can print itineraries. Dell will also preinstall user-requested software applications, including homegrown ones.

Fitzgerald is *Computerworld*'s senior editor, mobile computing. Gillin is *Computerworld*'s editor.

ThinkPad stands apart from masses

Model 755CD's black-matrix screen useful for presentations

By Jeffrey Gordon Angus

The world is over-populated with mammoth herds of interchangeable notebook computers with good computing muscle, identical toy keyboards, intermittently functional pointing devices and designs intended more for the convenience of the OEM parts supplier than the user.

There are a few exceptions, and if you believe it is worth paying a higher price for excellent engineering and design, IBM's ThinkPad line is noteworthy for the thoroughness of its design approach. IBM has thought of, and implemented, fine solutions in almost every element of a notebook that can be affected by industrial design.

IBM's ThinkPad 755CD is aimed at the mobile multimedia presentation market

Options galore

We tested one of the newest models, the ThinkPad 755CD. The lightweight notebook comes in several configurations with many options, all aimed at the mobile multimedia presentation market.

It features a core set of hardware: a 486DX clock-tripled to 100 MHz, a black-matrix color screen with a larger-than-average 10.4-in. diagonal viewing area, a sound system built around an IBM digital signal processor called MWave, removable floppy drive, removable hard drive with an upgradable base of 540M bytes, removable CD-ROM drive, 14.4K bit/sec. data/fax modem, infrared communications, external power supply and an upgradable base of 8M bytes of RAM. The 755CD carries a $7,599 list price.

The machine is terrifyingly expandable with a myriad of expansion ports for external hardware, including microphone, display, keyboard, a docking station and slots for PCMCIA cards (two Type I or II or one Type III).

The notebook is surprisingly light, less than 9 pounds with the hard drive and CD-ROM installed, and the case features a pair of thoughtful touches. The surface is slightly rough so you can more securely grip it when walking, and the underside has two small flip-out feet, like the ones on keyboards, to change the angle of the typing surface.

Equivalent engine

In actual work situations, the 100-MHz processor appears to perform about the same as the 66-MHz 486 chips on desktop machines.

The unit comes with IBM DOS 6.3, Microsoft Corp.'s Windows 3.11, utilities preinstalled and a sales-oriented, but still somewhat useful, multimedia presentation on the unit and its components. For safety's sake, the battery is not preinstalled, and the notebook must be opened to insert it.

The most important components of a computer are the ones humans use to interact with the machine: keyboard and screen. The keyboard has well-spaced keys for adult hands and provides some tactile feedback. It is quite acceptable, which is as good as notebook keyboards get. It also hosts a TrackPoint III — an IBM mouse surrogate that is as excellent productivity and ergonomic pointing device. Nestled between the G, H and B keys, it is a padded little joystick with tactile feedback and just enough resistance to make cursor navigation both accurate and smooth. The buttons for the mouse reside below the spacebar and also have superior resistance and feedback.

Seen from the side

The screen is crisp even with 65,000 colors, and the black-matrix TFT technology allows viewing from wide angles, which is necessary for presentation purposes.

The battery lasted about two hours when using the machine for multimedia presentation authoring and playback. A utility provides a useful estimate of the time remaining on the battery.

If you appreciate excellence and are willing to pay for it, this high-end ThinkPad is an impressive notebook.

Angus is a project director at The Data Works Ltd. in Seattle.

Briefs

Lotus gets organized

Lotus Development Corp. has announced it is now shipping Lotus Organizer 2.0 for $99. The product includes many new features such as group scheduling for Notes and CC:Mail users, the ability to categorize all entries and management of incoming and outgoing calls. It works with CC:Mail 2.0 or higher and Notes 3.1 or higher.

Small media grows up

Quarter-inch minicartridges got a boost recently when the five leading companies in the quarter-inch cartridge (QIC) industry announced Travan, a 3¾-in. technology that is supposed to more than double existing capacities. 3M Corp., Sony Corp.'s Recording Media group, Hewlett-Packard Co.'s Colorado Memory Systems Division, Conner Peripherals, Inc. and Iomega Corp. will submit a proposal to the QIC standards organization for ratification. Travan drives will be backward-compatible with current minicartridges, according to the companies.

Sharper handheld

Sharp Corp. has released Zaurus, its latest handheld organizer. The product is also called K-FDA. Sharp has enhanced the keyboard to make typing easier than in previous products such as Wizard. Zaurus uses Synergy, a proprietary operating system as well as a proprietary 16-bit processor. The handheld organizer has one Type II PCMCIA slot, built-in infrared Data Association infrared communications and weighs 13.6 ounces. The ZR-5000 Zaurus costs $749 or $849 with an external fax/modem included.

Mobile units go north

The Canadian military awarded a contract for more than 1,100 handheld computers to Litton Data Systems in Agoura Hills, Calif.

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23. Dir./Mgr. Sys. Development, Sys. Architecture
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(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

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70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
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(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

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Networking Products ❑ Yes ❑ No

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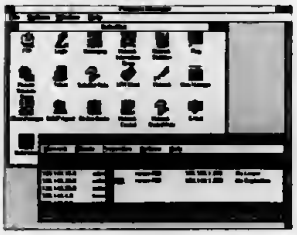

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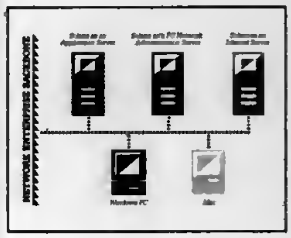

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PCIAD

Long-term patients dial in to managed health care

By Mitch Betts

Traditionally, the hospital was viewed as the place where real health care occurred. But that was before managed care, cost caps and the realization that a hospital is a very expensive hotel.

Now, the emerging trend is for more medical care to take place at the patient's home — where patients tend to get well quicker at a lower cost — and to use information technology to educate and monitor the at-home patient.

As an example of this trend, Quantum Health Resources, Inc. in Indianapolis will launch a pilot program this month using PC software to enhance the home treatment of hemophilia patients. Other candidates for home care include patients with high-risk pregnancies, diabetes, pneumonia, cancer, cystic fibrosis and chronic heart conditions.

"The problem is that when you move away from the hospital, information management and dissemination is weak," said William C. Reed, chief information officer at Quantum, which manages the care of patients needing costly long-term therapies.

So Quantum is deploying laptop PCs with special record-keeping and educational software to about 20 hemophilia patients. With the software, Quantum patients will keep a log of their daily infusion treatments and send the records via modem to Quantum for review.

The software was developed and customized by HealthDesk Corp. in Berkeley, Calif. HealthDesk was recently acquired by Access Health Marketing, Inc. in Rancho Cordova, Calif.

Tool for treatment

The key advantage of the software is that computerized records can be analyzed quickly by medical experts to see if any changes in treatment are needed. Improper infusions can lead to a "catastrophic bleeding episode," which is dangerous and costly.

In the managed care business, Quantum agrees to care for a hemophiliac patient for, say, $40,000 a year. However, if the patient has a catastrophic bleeding episode, the cost of care increases to $100,000 for hospitalization and rehabilitation. So Quantum has good incentive to monitor the at-home care.

Software developed by HealthDesk *lets hemophiliacs log their treatments at home and send the records to their health care provider via modem for review*

If the pilot is successful, the program could move beyond data collection and add a computer bulletin board system so doctors and patients can share information on best practices, Reed said.

Future use

Home-based health care represents just 3% of health care spending nationwide, but the Congressional Budget Office in Washington predicts that amount will quadruple by the year 2000.

Experts contend that, in the future, at-home care may be used not only for post-hospital recuperation but also as a way to avert costly hospitalization in the first place. For example, the family doctor may start to refer certain patients to a home-care contractor rather than a hospital.

Altsys Corp. has announced Fontographer 4.1, font editing and creation software for the Macintosh.

According to the Richardson, Texas, company, Fontographer 4.1 includes a perspective tool that provides three-dimensional rotation to two-dimensional objects and an arc tool that creates arcs.

The product runs faster on the Power Macintosh. A Smart Installer feature determines the machine type at installation and installs the appropriate version.

Features include improved bit-map generation, hinting and autospacing.

Fontographer 4.1 costs $495.

▶ *Altsys*
(214) 680-2060

Virtual Reality Labs has announced Formbuster 2.0 for Windows, forms software.

According to the San Luis Obispo, Calif., company, Formbuster 2.0 for Windows converts paper forms to electronic forms via a fax machine or scanner. Users can also print directly into Formbuster using the product's print driver.

A Dynamic Tabs feature lets users go through forms and store historical information. Each Dynamic Tab is a database for retrieving information for each line of the form.

Using Microsoft Corp.'s Open Database Connectivity technology, standalone and networked databases can interface with Formbuster.

Formbuster 2.0 for Windows costs $99.

▶ *Virtual Reality Labs*
(805) 545-8515

Actix Systems, Inc. has announced Picasso, a 32-bit dynamic RAM graphics accelerator card.

According to the Santa Clara, Calif., company, Picasso includes a 32-bit graphics engine with 1M or 2M bytes of dynamic RAM and a 32-bit Peripheral Component interconnect bus design.

Features include 800- by 600-pixel noninterlaced resolution, support for large monitors and a 72Hz refresh rate.

Picasso costs $179.

▶ *Actix Systems*
(408) 986-1625

FarPoint Communications has announced the F/portIDE, an I/O card.

According to the Lancaster, Calif., company, F/portIDE provides one-slot, high-speed connectivity to PC peripherals. It features an intelligent drive electronics (IDE) controller for two IDE hard disk drives, a two-unit floppy disk drive controller, a game port, two serial ports and a parallel port.

The parallel port supports the Enhanced Parallel Port and Extended Capabilities Port protocols for connection to LAN adapters, tape backup systems, external hard drives, CD-ROMs, printers and parallel-to-SCSI adapters.

The F/portIDE costs $129.

▶ *FarPoint Communications*
(805) 726-4420

Winchester Systems has announced FlashDisk 3, a high-speed disk array for SCSI-compatible PCs and workstations.

According to the Woburn, Mass., company, FlashDisk 3 delivers up to 1,000 read/write operations per second by using a high-speed cache controller. It was designed for disk-intensive applications.

The product can control up to seven SCSI disk drives or up to 63G bytes using 9G-byte drives. Controller cache stores up to 64M bytes of memory.

A write caching option frees the application to continue while the actual write operation is completed in the background.

Prices start at $13,995 for a FlashDisk 3 with 4G bytes of storage.

▶ *Winchester Systems*
(617) 933-8500

Kensington Microware Ltd. has announced Thinking Mouse, a four-button mouse input device for PCs and Macintoshes.

According to the San Mateo, Calif., company, Thinking Mouse lets users customize feature sets for each installed application. It automatically remembers each application's configuration as the user switches among programs.

Software features include the ability to jump to a predefined hot spot on the screen, automatic movement to a default button on a screen dialog and a warning to users to take breaks.

Prices range from $89 to $119.

▶ *Kensington Microware*
(415) 572-2700

Cylogic, Inc. has announced Voice User, a set of voice commands that run on Microsoft Corp.'s Voice Pilot voice-recognition software.

According to the Seattle firm, Voice User replaces the default commands of Voice Pilot with more than 200 intuitive voice commands that provide fast access to common PC functions.

Users can execute a function that takes three mouse clicks with one voice command. The product requires Microsoft's Sound System 2.0.

Voice User costs $49.

▶ *Cylogic*
(206) 283-8800

Interactive Products, Inc. has announced Simply Voice for DOS, voice recognition software that provides voice command and control of applications.

According to the Eugene, Ore., company, Simply Voice for DOS has up to 150 words in an active vocabulary. It operates as a word-isolated system that ignores background noise and unfamiliar words.

Simply Voice for DOS costs $79.

▶ *Interactive Products*
(503) 341-4964

PC Security has announced Stoplock V, PC security software.

According to the Gainesville, Va., company, Stoplock V features secure data transfer, user profile options and a secure client interface facility. The facility enables the software to share security information with other security systems.

Electronic mail encryption is also available.

Stoplock V costs $295.

▶ *PC Security*
(703) 349-0066

Xenodata Corp. has announced DataLock, security software for DOS and Windows.

According to the San Antonio, Texas, company, DataLock uses on-the-fly encryption and decryption. Locked files can be accessed only by computers running the same serialized copy of DataLock.

The product runs in the background and requires no end-user intervention.

DataLock costs $300.

▶ *Xenodata*
(210) 826-8903

Hilgraeve, Inc. has announced HyperAccess 2.0 for Windows, communications software.

According to the Monroe, Mich., company, HyperAccess 2.0 for Windows provides communication with remote systems, on-line services and the Internet.

Features include a directory importing facility and automatic identification of the appropriate parity, stop bit and data bit settings so the user needs only the phone number.

The product supports shared modems and provides virus protection during file transfers.

HyperAccess 2.0 for Windows costs $149.

▶ *Hilgraeve*
(313) 243-0576

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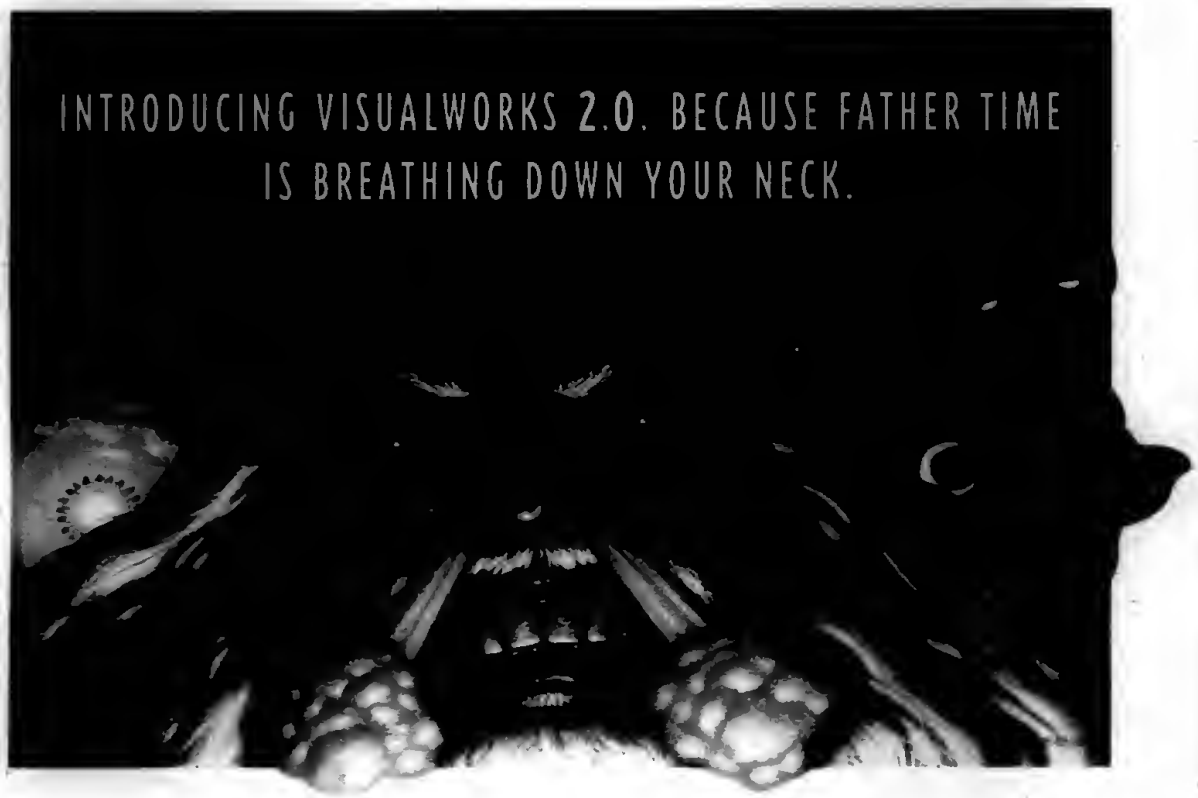

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Differences found in new Lotus strategy

By Suruchi Mohan

■ Lotus Development Corp.'s year-end declaration of a new communications strategy was designed to give users more choices when upgrading their CC:Mail and Notes systems.

Although Lotus is going to great lengths to say the new strategy does not constitute a departure from the Lotus Communications Server (LCS) strategy announced in September 1993, users will find some differences between the two.

Perhaps the single most important difference network administrators need to know about is that while the original strategy called for a single server, the new one does not, according to David Marshak, vice president and senior consultant at Patricia Seybold Group in Boston. The Lotus Communications Server — now called the Lotus Communications Strategy — would have been a common back end for CC:Mail file sharing, CC:Mail client/server and Notes. The problem under the old strategy was that users would have had to upgrade to LCS to upgrade their mail systems.

E MAIL

Options available

Under the new strategy, users do not have to buy the client/server version of CC:Mail if they want only file sharing capabilities. They can buy the file sharing version, which will involve upgrading the client and the post office. However, because this client will have the capability to talk to the client/server system, users will not have to change the client if they want to upgrade to a client/server architecture later on.

"In order to upgrade CC:Mail, you get just CC:Mail, no LCS," Marshak said. "The CC:Mail client will run against either client/server or file sharing servers." He also said the new strategy will have two servers and one client, whereas LCS had one server and two clients. "The change of architecture is strongly beneficial to CC:Mail users and not beneficial to Notes users," he said.

Not all users will find this strategy useful. A user at a major bank said it "won't affect our plans because we are going to X.400 anyway." If his organization had been following the LCS strategy, the announcement would have been significant. "X.400 obviates LCS in the short term," he said.

Users decide

X.400 and Simple Mail Transfer Protocol (SMTP) support were big in LCS. While support for these transport protocols will still be native, not through gateways, the features users get will be determined by what they want as they make their implementation plans, Marshak said. Lotus is essentially giving itself more time without promising a slew of features to all users, many of whom may not even need X.400 and SMTP. Sara Radicati, president of The Radicati Group in Palo Alto, Calif., called it a "packaging issue."

Finally, Lotus' position on the support of directory services, though much clearer than in the past, is still fuzzy. One factor that may be inconvenient to administrators in large Novell, Inc. NetWare shops is that the Lotus directory will not map directly to the Novell directory.

This will be an issue for Mike Murdock, a programmer analyst at the University of North Texas at Denton. "We have 67 file servers. If it doesn't fit in well with NetWare Directory Services, it could be an administrative issue," he said.

Novell, Collabra ink deal

Combined effort will target group conferencing, Lotus' Notes

By William Brandel

Since the beginning of this decade, only one product has had the development and marketing muscle to single-handedly define the meaning of groupware and group conferencing: Notes from Lotus Development Corp. Well, another big player is about to enter the fray.

That player, Novell, Inc., happens to own about 70% of the market for LANs. Novell has agreed to sell a tightly integrated version of Collabra Software, Inc.'s Collabra Share electronic forum application to run with Novell's group messaging products.

Collabra will build a version of its Collabra Share product that will be closely integrated with Novell's Collaborative Computing Environment architecture. In doing so, Collabra will run with Novell's GroupWise as well as the company's other networkable applications, such as SoftSolutions and Envoy.

Easier management

Like GroupWise, Collabra Share can be managed from the same console as the NetWare server. This integration will take on more significance as Novell delivers an expected follow-on version to NetWare 4.1 some time this year. The GroupWise message store is expected to be included in this.

As a result, sites could conceivably manage all their messaging products, including Collabra Share, using one management console and one directory structure, NetWare Directory Services. In its first version, Collabra Share for GroupWise will still use Collabra Share's directory.

Novell and Collabra will also deliver a "skinny" version of the Collabra Share client, which will be added as a standard feature in GroupWise at no extra cost. This version will not include enterprise support or all the security features of the full-blown model.

Following this strategy, Novell, like Lotus with Notes, will give its customers a modular approach that they can implement on their own time schedule, said Jamie Lewis, president of The Burton Group in Salt Lake City.

This thinking sits well with current GroupWise user Frank Gioffre, electronic-mail architect at the Naval War Center in Lakehurst, N.J. Gioffre said his site wants to bring Notes capabilities in-house but does not want to make the investment required to do so.

"I've worked with Notes, and it involves a big investment in terms of money, manpower and training," Gioffre said. "Notes is very nice, but it involves a learning curve and a lot of dedicated people."

Instead, Gioffre said he would like to bring Collabra in-house and run it with GroupWise.

"If Collabra is integrated into GroupWise and our LAN, it would probably give us the group discussion capabilities, or Notes-like features, that we are looking for," he said.

Lotus Notes vs. Novell's GroupWise/Collabra

Lotus Notes	Similar features	GroupWise/Collabra
• Supports full database replication	• LAN transport-based messaging	• Will support messaging replication
• Has adopted X.500-based directory structure from Unisys	• Document-centric	• Will be based on Novell's NetWare Directory Services
• Will be managed through NotesView, based on Hewlett-Packard's OpenView	• Data encryption, security	• Will be managed through any SNMP management system
	• Workflow	
	• Group conferencing	

Warning issued

While GroupWise and Collabra are helping to raise the bar for users in the groupware market, Novell must continue to be application-agnostic in its treatment of Notes, warned Ann Palermo, an analyst at International Data Corp. (IDC) in Framingham, Mass.

In a recent report on the Novell/Collabra effort, Pa-

Novell, *page 53*

U.S. Customs automates export system

By Gary H. Anthes
WASHINGTON

In an effort to facilitate shipping and strengthen compliance with export regulations, the U.S. Customs Service is automating the processing of export information. However, many companies fear the new Automated Export System (AES) will strangle their shipments in digital red tape.

"AES is not just rearranging deck chairs when it comes to [export] facilitation. It is stacking those chairs in the exits by making export much more difficult," said Hugo Biasdel, chairman of the Regulations and Automation Committee of the Small Business Exporters Association in Annandale, Va.

The Customs Service wants to improve its maintenance and reporting of trade statistics, boost collection of harbor maintenance fees and strengthen its enforcement of export laws. To do that, AES will collect and validate data on shipments before they leave port. Under current manual and automated methods, data is processed after the ship sails.

"I don't object to having the data right, but I do object to having it right up front," Biasdel said. "The data they are validating against can change 100 times a day."

"Shipments will go through a number of clearances, and if you have a [computer edit] hit, that will essentially stop your shipment," said Alan Wander, director of export regulations at Eastman Kodak Co. "The dilemma that we would have is that one box on a 40-foot container could stop that whole container."

Wander also said a one-day delay in clearing up a

Export, *page 52*

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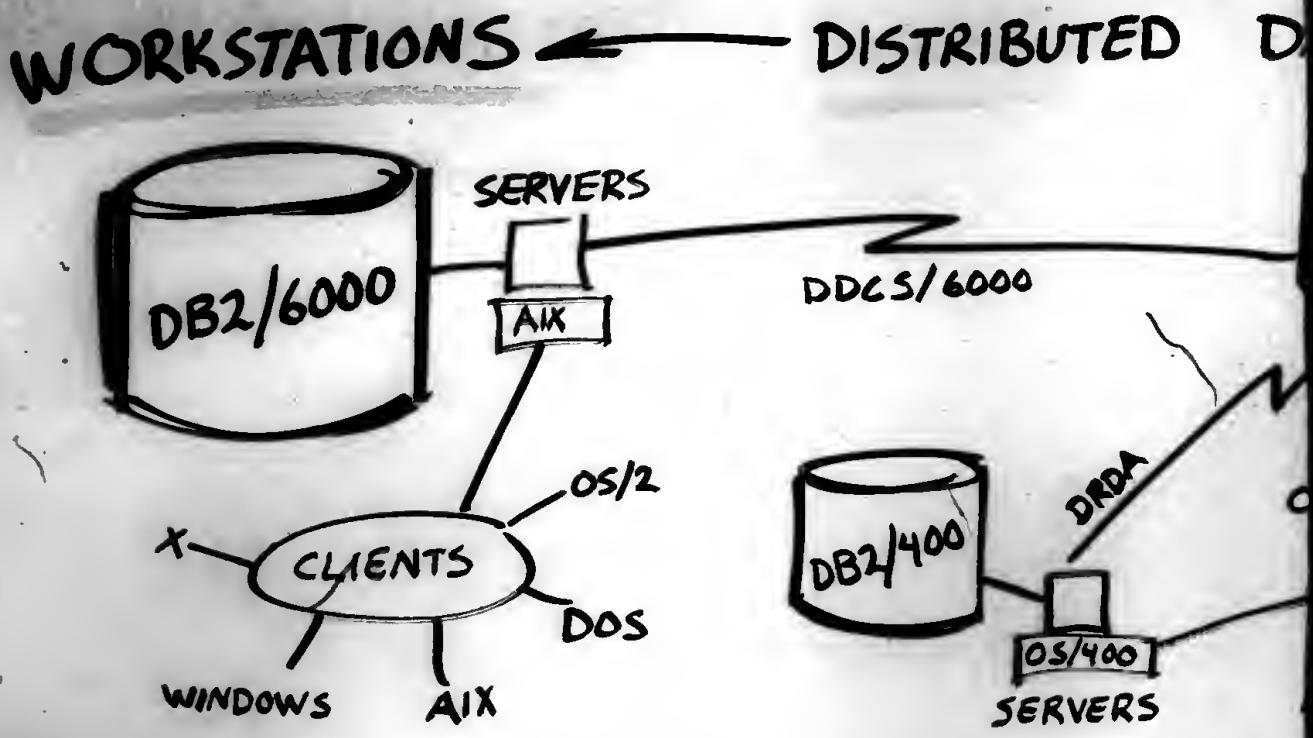

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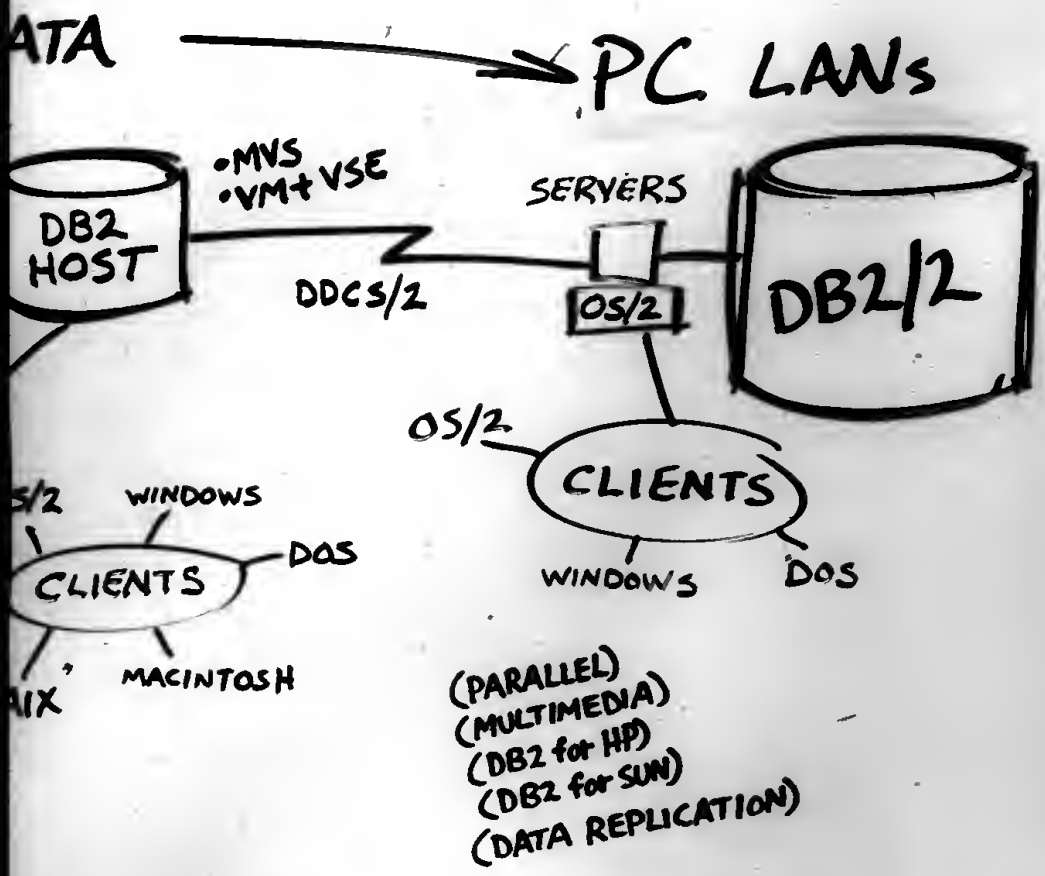

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Suruchi Mohan

Ease into multimedia

While the industry organizes seminars and conferences, corporate users still scratch their heads over how to use multimedia technology that, at least now, creates more problems — chiefly in terms of handling large volumes of streaming, real-time data — in certain environments than it solves. At the same time, they do feel the need to do something.

At a recent seminar, I ran into a woman from a major West Coast bank who said she wanted to hire people to help develop multimedia applications to sell products. Since banks primarily sell services, I figured that's what she meant.

Refusing to talk to me as a member of the press, the woman conferred with another seminar attendee, whom I later approached to ask what the woman wanted. "I don't think she knows what she wants," he told me conspiratorially. The man couldn't have summed up better the confusion that reigns in the multimedia arena. The question that recurs in worried minds is: What multimedia application should I use in my organization so I don't get left behind in the technology race?

Industry consultants talk all the time about large organizations such as the bank begging for help in multimedia. They do not know what they want, just that they do not want to be left out of the race.

What they need, in essence, is a killer app. However, there is no such application that will force multimedia on all networks or desktops. The use of the technology is still largely confined to training and presentations. Videoconferencing is erupting in certain vertical markets — especially the medical area — but even the most avid proponent can't make a business case for widespread adoption in the face of high setup costs. (It will be interesting to see, however, how long the medical community's euphoria about videoconferencing lasts, given the legal implications of long-distance medicine in a litigation-happy society.)

> In the ultimate analysis, multimedia technology is no different from any other

Those whose livelihood depends on multimedia are, of course, bullish about the use of the technology in the brave new world. They don't doubt that the PC will quickly evolve from a personal information tool to a communications tool that generously employs rich text, video and audio for high-end business applications such as (surprise) training, videoconferencing and presentations.

But even these experts say there is no reason to panic and jump on the multimedia bandwagon. It is essential to evaluate business needs: Is a move to multimedia part of a fad, or will a multimedia application yield tangible results that benefit shareholders? What is the purpose of incorporating this technology into the existing environment?

John Hiles, president of Thinking Tools in Monterey, Calif., says multimedia technology is especially relevant in environments where salespeople and customers have to deal with a high level of product complexity.

In the ultimate analysis, multimedia technology is no different from any other, where the technology must be subordinate to the needs of the business.

This means IS managers need not get frantic about bringing multimedia into their environment for fear they will be left behind. However, they cannot afford to sit in blissful ignorance while the rest of the world scopes out the relevance of multimedia in a business environment. They must keep a watchful eye on the technologies as they emerge and see if any will increase productivity in their particular line of business. If one technology strikes managers as having the ability to do so, they should begin rolling multimedia into their environment.

Mohan is a senior writer in *Computerworld*'s West Coast bureau.

Export

CONTINUED FROM PAGE 49

data problem could hold up a shipment more than a week while it waits for another ship to sail.

Wander said Kodak's computer systems perform numerous checks, such as ensuring a shipment is not intended for one of hundreds of buyers proscribed by the U.S. government. "Essentially, the government is preparing to take over that preclearance checking," he said. "The goals seem reasonable, but the ends do not justify the means."

Customs officials say industry worries are exaggerated. "We are working very closely [with exporters] to ensure that we are capturing only the needed data elements and that we are requiring those data elements at an appropriate time so we do not hold up the export of cargo," said Sharon Mazur, director of AES development.

"We are trying to strike a delicate balance between doing our [enforcement] jobs and facilitating exports," she added.

Ray Pechacek, co-chairman of the Trade Resource Group, an industry group established by the Customs Service to advise it on export systems issues, said it was "our goal" that AES not delay shipments. "We are trying to work through these issues right now," he said. "But it's kind of premature. The system design has not been finalized."

Pechacek, who works at a Fortune 100 exporter, acknowledged that AES would require more information from exporters than is now demanded by federal agencies. He said trade agreements will result in more government need for data, and AES is trying to anticipate those needs now.

Exporters also fret that the government may eliminate the $2,500 limit below which shipments may now go without documentation. "That's what worries me the most," Wander said. He said it would quadruple the number of shipments Kodak must report to the government, which is currently about 3,800 per month.

However, Pechacek said the reporting exemption for low-value shipments is expected to remain the same. But Mazur seemed less sure. "It's an issue that's on the table," she said. She urged exporters to attend a public meeting Jan. 31 in Washington to air concerns about AES.

Mazur insisted that exporters will benefit from AES. "We will be able to automatically check — through another government agency gateway — to see if there is an export license on file," she said. "If there is, there is no need to hold that shipment up, and so it goes right away."

Pechacek said AES' linkage with import systems will also expedite the flow of goods that pass through the U.S.

AES officials can be reached via the Internet at exports@export01.customs.sprint.com.

How it works

AES will be a Cobol/CICS application running on an IBM ES/9000 mainframe in Washington. It will be connected to some 8,000 terminals around the country. Input from 125,000 exporters will come in via electronic data interchange transactions in X.12 or EDIFACT formats, or it can be entered at kiosks at customs port facilities.

AES will edit export data for compliance with federal laws and licensing regulations, collect trade statistics for government reporting and help manage the collection of harbor maintenance fees. It will serve as a central repository for export information and act as a gateway to related systems at the U.S. departments of State, Commerce and Defense.

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Tobit Software unveils FaxWare

32-bit NLM lets users send faxes on 64 lines

By Laura DiDio

Tobit Software International in Santa Clara, Calif., and Ahaus, Germany, recently introduced FaxWare, a 32-bit Novell, Inc. NetWare Loadable Module (NLM) that provides fax services for up to 1,000 users simultaneously on a single LAN.

FaxWare, which is new to the U.S. market, is a hardware-independent NLM that is embedded directly into the NetWare 3.x and 4.x code, said Charles Heindel, vice president and general manager of Tobit Software North America.

The FaxWare NLM lets NetWare users send faxes on 64 lines at 14.4 bit/sec while supporting a maximum of 1,000 end users and 32 file servers per LAN, Heindel said. Businesses can send and receive faxes utilizing all the major desktop operating systems, including DOS, Windows, OS/2, Macintosh and Unix.

The primary component of FaxWare is the so-called service layer, which is part of the 32-bit NetWare network operating system, Heindel said. The secondary component is the transport layer driver, which allows the software to be hardware independent. The third piece is the front-end layer, which provides the front ends for operating systems such as DOS.

Enormous benefits

"This gives users a big boost in performance over DOS-based PC fax servers, such as the ability to support 64 telephone lines at once," Heindel said. Heindel said, unlike FaxWare, fax server software packages have traditionally been loaded on top of network operating systems.

Peter Davidson, president of Davidson Consulting, Inc. in Burbank, Calif., agreed, noting that FaxWare is only the third NLM-based fax server software package currently available in a rapidly emerging market.

According to Davidson, the NLM fax server market leaders are Cheyenne Communications, Inc.'s FAXserve and Biscom, Inc.'s Faxcom for NetWare, both of which have been shipping for about a year. But he said there is plenty of room for Tobit because "the fax server market is just taking off."

"There's a real need for fax servers; it's the only universal automated method of getting computer files off the LAN. E-mail only reaches so many people; faxes reach everybody," Davidson said.

Davidson described FaxWare as an "intriguing" product. He said it is definitely worth looking at because NLM-based fax servers offer distinct price/performance advantages over the majority of PC-based fax servers that run under DOS.

Fewer dedicated PCs

"The fact that the fax server software runs on a file server will save users the cost of buying a dedicated 486-based PC. This can represent significant cost savings and network management headaches in large networks," Davidson said. "Corporations might typically install anywhere from 10 to 30 dedicated PC-based fax servers at costs ranging from $20,000 to $60,000."

The FaxWare starter pack, supporting a maximum of five users on a single line, is available now and lists for $790. Users can purchase additional FaxWare packs in five-user increments for $290 for each additional phone line, Heindel said.

Piece of the pie

Tobit Software International is one of the premier NLM developers in Europe. The Germany-based parent organization holds 85% of the European market for fax servers.

Centigram Communications Corp. has announced the Adaptive Information Processing (AIP) 120 platform, a communications system that supports up to 1,500 users and integrates voice, data and fax.

According to the San Jose, Calif., company, the AIP 120 supports up to 20 ports and 40 hours of speech storage. It features fax storage and forwarding capabilities, integrated multimedia messaging for the desktop and a voice messaging system.

Starting prices range from $8,000 to $10,000.

▶ *Centigram Communications*
(408) 944-0250

Security Integration, Inc. has announced VirusNet 2.0, antivirus software.

According to the Lexington, Mass., company, VirusNet 2.0 provides automatic antivirus control and provides a scheduler so network administrators can schedule virus scans, tape backups or automatic dial-up file transfers.

Features include a centralized rescue disk, a low-memory monitor and automatic installation on network workstations.

A single copy of VirusNet 2.0 costs $50.

▶ *Security Integration*
(617) 861-8800

Product shorts

GrayMatter Software Corp. has announced ScriptServer NQM, queue management software. ScriptServer NQM manages print queues in a mixed network environment and can route or reroute print jobs to or from restricted printers via a meta-queues feature. Cost: starts at $2,990. Gray Matter Software, Seattle, Wash. (206) 281-8800. . . . **Aurora Technologies, Inc.** has announced Aurora Sbus terminal and communications servers with enhanced tools, including transparent print, a Point-to-Point Protocol accelerator and screening of a terminal's multitasking utility. Cost: $499 to $9,999. Aurora Technologies, Waltham, Mass. (617) 290-4800.

Novell

CONTINUED FROM PAGE 49

lermo stated that Novell's best strategy would be to provide SoftSolutions and Collabra users with the ability to pull down data from Notes databases and GroupWise databases. GroupWise will provide as much interoperability with Microsoft Corp.'s unshipped Exchange Server by providing full Messaging Application Programming Interface compliance, she said.

While pricing has not yet been set on the undelivered Collabra Share for GroupWise, IDC estimated it will carry a list price of $69 per user and $899 per enterprise extension. The product is expected to be delivered through Novell resellers in the first quarter of 1995.

Multimedia

OMF lets users share files across different platforms

By Suruchi Mohan

As more companies rush into the multimedia arena, the need for conversion from one platform to another is becoming ever more pressing. Traditionally, no file format could work across different platforms without considerable loss of quality.

The Open Media Framework (OMF) Interchange is a file format that lets users do just that. Started by Avid Technology, Inc. in Tewksbury, Mass., in an effort to meet the growing demands of customers who wanted plug-and-play interoperability among different computing platforms, OMF was released as a specification — OMF 1.0 — in 1993. At a recent meeting in Scottsdale, Ariz., Avid and about 30 developers discussed several proposals to further the standard. The results are likely to be seen in April in Release 2.0 of OMF.

The heart of the matter

At its simplest, OMF is a way for users in Macintosh, Windows and Silicon Graphics, Inc. workstation environments to share files. It is aimed at users in post-production environments who need to do a lot of editing across different platforms.

For example, Rob Kobrin, a freelance feature film editor in Los Angeles, translates film to a digitized computer format. Once the format is OMF-compliant, images from one computer can be captured by others on the network. Because of OMF, Kobrin is able to go from computer to computer in the editing process without worrying about conversions from one format to another.

The Interactive Multimedia Association (IMA) in Annapolis, Md., has seen the merits of this approach and is working with the OMF Interchange group to further the specification. In 1993, when the IMA put out a request for technology that would make multimedia easy to access in the network computing environment, Apple responded with its Bento format, said Brian Marquardt, a compatibility project director at the IMA. Bento is a format for a container that transfers data across networked computers. OMF is a superset of Bento and indicates where different blocks of information can be found.

Three parts at work

OMF consists of three parts: digital media data, such as video, audio and graphics; a description of how the data goes in time, for example, if the video and audio are in sync; and source reference information, which allows a user to trace a file to its source. All other file formats are for the exchange of media data only, explained Greg Clukey, OMF program director at Avid.

An example of how OMF works is that it would place a wrapper around a .WAV file from an Intel Corp.-based PC and send it to another environment, such as a Macintosh, where the Macintosh would recognize the .WAV file and convert it to a Macintosh format.

Version 2.0 of OMF will define a richer video format; provide an effects model such that any audio or video effect can be exchanged between two different applications; and add Musical Instrument Digital Interface support to OMF.

Avid provides the OMF Interchange tool kit, which contains application programming interfaces around which developers can build applications. The one-time fee is $499.

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Unix systems exploited by security holes

Hackers use automated process to break in; patches offer protection

By Gary H. Anthes

An increase in the use of automated hacking tools and users' failure to apply known software fixes are sharply boosting Unix systems break-ins.

Recently, the Computer Emergency Response Team (CERT) at Carnegie Mellon University in Pittsburgh sent an alert over the Internet warning users of increased exploitation of security holes in Unix's Network File System (NFS). The advisory outlined a number of precautions and software "patches" that users can employ to protect their Unix hosts (see chart page 61).

The alert said tools used by intruders to exploit NFS vulnerabilities are widely available. Their impact varies, but, in the worst case, intruders can use them to gain unauthorized root access from a remote host.

> "Years ago people used to say that most break-ins were the result of bad passwords. Now [the leading cause] is the failure to apply known [software] patches.
>
> – John Wack
> National Institute of Standards and Technology

Hacker's script

"People are starting to take advantage of these problems more than in the past," said Rik Farrow, an Internet security consultant in Sedona, Ariz. "Someone figures out how to do it, then he codifies it into what's called an 'exploit script.' They are automating the process."

Farrow said many users face risks from Unix "portmapper" programs — where remote procedure call services are registered. Using a method called proxy access, hackers can trick some portmappers into granting a request to get into a host's NFS as though the request is coming from a local source, effectively bypassing the built-in security filters that block access to NFS from the outside.

Blocking attacks

The CERT advisory told users where to get a portmapper that disallows proxy access and also advised the use of firewalls, which can block threatening IP traffic.

"The use of firewalls to protect against attacks from outside the corporate network is quite common for sites connecting to the Internet," said Saqib Jang, a security specialist at SunSoft, Inc. in Mountain View, Calif. "However, deployment of portmapper fixes to address attacks from inside the company is less common except among early adopters and security-conscious customers."

Jang said some companies are beginning to use firewalls to create internal network domains with varying levels of security. For example, SunSoft's FireWall-1 package can protect against attacks from lower security domains within the company network, he said.

While some users bemoan the security holes in Unix, security experts say users are often to blame for their woes. "Years ago people used to say that most break-ins were the

Unix, *page 61*

Network management

ATM technology slowed by lack of tools, standards

By Steve Moore

■ Much of the hype surrounding the emerging Asynchronous Transfer Mode (ATM) data transmission scheme is that it will reduce the cost of network management. That possibility exists, but users and analysts are uncertain about whether and when it will be realized.

The problem is that for ATM to lower network management costs, users will have to switch to an all-ATM scheme for both local- and wide-area needs. That is not likely to happen any time soon, according to observers.

"All the applications out there are tied to your routing infrastructure," said Peter Ho, supervisor of network architecture and software services at Unocal Corp. in Los Angeles. "Until applications are written directly for ATM, you won't be able to get away from the routers. So ATM adds another layer of things you have to manage."

ATM network management

Pros:

- Virtual LAN capability reduces administrative costs by allowing moves, adds and changes to be accomplished remotely via software
- Use of the same technology across WANs and LANs eliminates multiple management tools and reduces staff requirements
- Virtual LAN capability minimizes disruptive changes to network cabling

Cons:

- Initially adds another layer of complexity
- Few applications yet written specifically for ATM
- ATM standards are still in flux

Management reductions possible

"If you have ATM from the desktop to the campus backbone to the wide-area network, you will be able to reduce your network management cost," said Michael Howard, president of Infonetics Research, Inc. in San Jose, Calif. Compared with having a mixed network architecture with Ethernet, Token Ring, Fiber Distributed Data Interface and ATM, "pure ATM could reduce your management staff by half," he said.

But while that benefit is theoretically achievable, Howard added that "in the real world, people won't have pure ATM environments. Most companies are not any time soon, if ever, going to throw away all their existing LANs and router backbones."

Many users today are satisfied with the management capabilities that Remote Network Monitoring (Rmon) brings to LANs.

"Right now Rmon probes fulfill all our network management needs because we can see each segment in the finest detail and manage it from anywhere," said Parvez Erani, a technical manager at St. Mary Medical Center in Long Beach, Calif. While ATM's speed and other advantages may justify its use in the future, Erani said, "at this stage we would not install ATM for its network management benefits."

Another cost will be the new tools needed to help users manage ATM networks.

"Given the volume of data and number of packets going across an ATM circuit, Rmon as we know it today will not be a viable tool," said Rick Sturm, a senior technical staff member at US West, Inc. in Denver. "In an ATM environment, you will not have a box big enough and fast enough to capture all the data as you do today with Rmon devices," he said.

No nirvana now

"ATM at first will be just another technology that makes things more complicated," said James Herman, a vice president at Northeast Consulting Resources, Inc. in Boston. An end-to-end ATM nirvana may take as long as eight years to arrive, he noted, adding that "until then, it will bring more complexity and more management problems, not less."

Even with localized ATM LAN implementations, "Users say the management tools are totally inadequate, and few vendors provide end-to-end management even within their own environments," said John Morency, a principal consultant at Strategic Networks Consulting, Inc. in Rockland, Mass.

Yet another future benefit of ATM is that it will allow end users to define different physical LAN segments to be grouped in software-defined virtual LANs. As a result, network administrators will be able to remotely accomplish moves, adds and changes without needing on-the-spot technicians to change wiring or reconfigure routers.

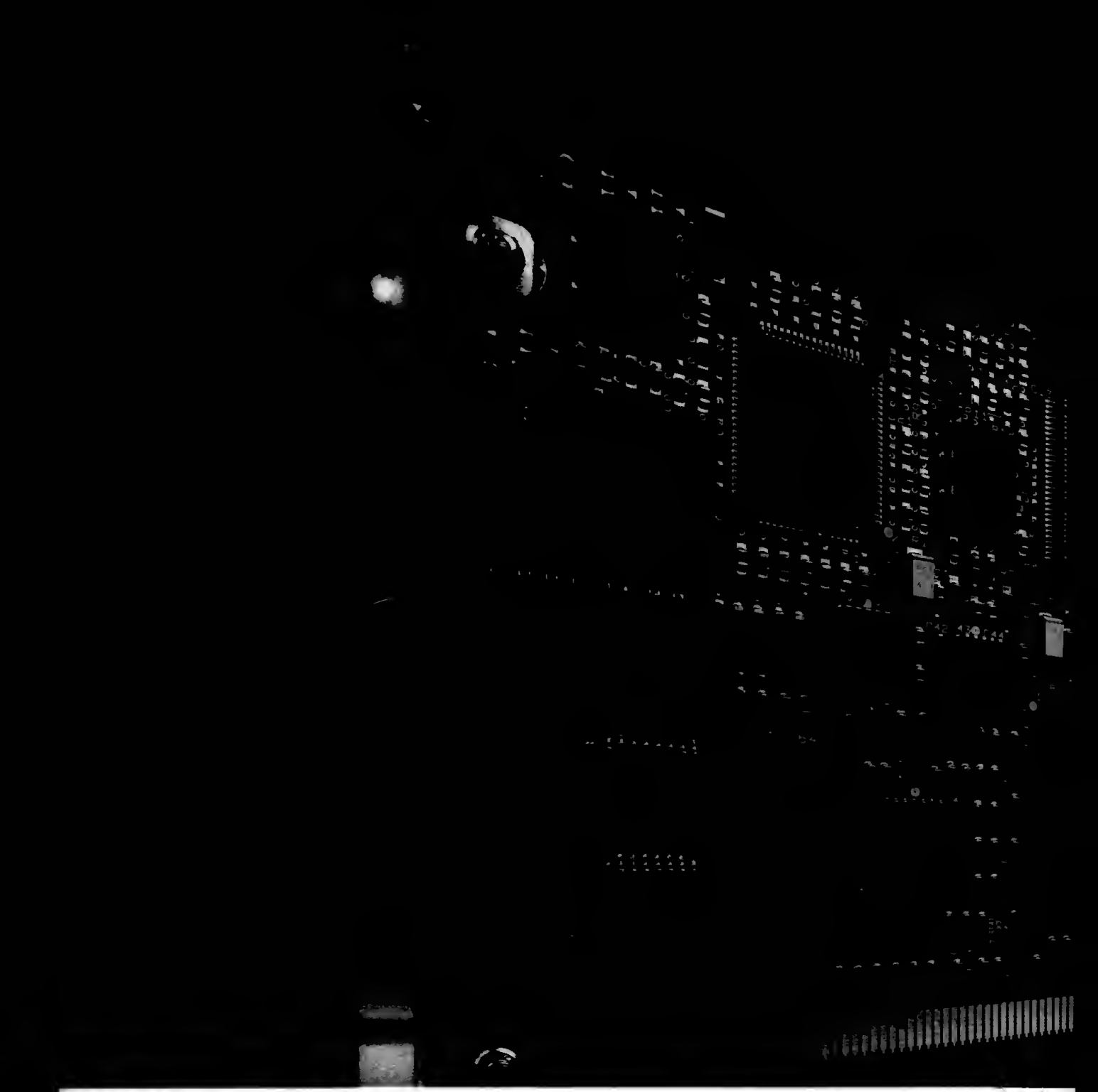
The ATM advantage

"There will be a 60% to 70% cost advantage down the road to make user changes through software," said Tom Dyal, product line manager for network management at Bay Networks, Inc. in Santa Clara, Calif.

These figures hold true for any virtual LAN technology; ATM is one of three major ways of doing virtual LANs. Dyal noted that on average, companies move their employees once a year at a cost of $300 to $500 each.

In addition to providing labor cost savings, he said, ATM's ability to support software-based changes "will help stabilize the network cabling plan and wiring infrastructure. When you make a physical change, you're introducing risk," he said.

Users and analysts agreed that to some extent ATM's increased complexity will offset the network management benefits it brings. Sturm advised users to carefully assess ATM's management costs and benefits before making it a part of any strategic business decision.



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Web services snare managers

IBM, Digital market Web construction

By Ellis Booker

The phenomenal growth of World-Wide Web sites on the Internet has sparked an industry in Web consulting and services. Players include mainline hardware giants such as IBM and Digital Equipment Corp., Internet access providers such as Portal Information Network and UUNET and a slew of private consultants.

Information systems managers, under intense pressure to get their company's Web pages up and running, are now busy weighing whether to enlist outside help.

Big range

Fees for Web consulting services can range from a few hundred dollars for an individual home page to upward of $25,000 for a complex commercial site. Unfortunately, the emerging Web services industry has yet to hit on a single pricing model, so comparison shopping is a must.

But complicating matters is the fact that prices for Web construction and consulting vary dramatically. "It goes from a few hundred dollars to $25,000," notes Jayne Levin, editor of "The Internet Letter," in Washington.

None other than IBM — which did not even have a booth at the 1993 Internet World Trade show — announced at the 1994 show that it would offer services for home pages, content hosting and Web applications across its IBM Global Network in the first quarter this year.

IBM has already constructed several Webs for customers since it created its own corporate home page in April. But this work has been "pro bono," according to company sources.

The new IBM service offerings will be provided by the IBM Global Network through its U.S. arm, Advantis. Advantis will work with the IBM Consulting Group and Integrated Systems Solutions Corp., IBM's outsourcing unit.

Breaking into the Web

IBM's announcements follow those of Digital in November. Digital made a highly publicized entry into the Web site construction business with its work on the state of California's electoral server, believed to be among the largest Web sites built to date.

Internet access providers are getting into the game as well. Portal Information Network in Cupertino, Calif., likewise announced Internet construction and maintenance offerings at the show. Portal's Custom Network Services can include any one of three elements: a national, fault-tolerant network, transactional services such as account creation, billing and usage reports; and large-scale, object-oriented information storage using Oracle Corp. tools.

A lot of bits

Web traffic currently accounts for 800M bits per day on the Internet.

But will the bottom fall out of the Web services business once easy-to-use HyperText Markup Language (HTML) tools are available for end users? HTML is the veritable DNA of the Web, the technology that works the point-and-click hyperlinks within and between pages.

"It's likely that HTML [tools] will become fairly generic within two years," said John Little, president of Portal. But when that happens, he said, Portal will simply move higher up the value chain into more sophisticated transaction processing and content management.

Reporting of Web traffic may be a distinguishing characteristic among these Web outsourcers, analysts said. The most viable virtual storefronts, they said, will be those that offer information about traffic. This data can then be used to change the look and content of the storefront or Web page.

Browsers to spark Internet use

By Ellis Booker

Prognosticating the commercial uses of the Internet is a bit like watching fireworks: One can anticipate each explosive pattern without knowing precisely when and where it will appear.

Two technical developments will spur business on the Internet in 1995. Both are related to browser software — graphical clients such as Mosaic that allow point-and-click navigation of World-Wide Web servers. Multimedia-capable Web sites are the fastest growing thing on the Internet, with some 200 to 300 appearing weekly.

New browsers on the way

The first development will be the availability of secure Internet clients and servers in early 1995.

"Watch for great advances in the browser field," said Greg Cline, director of network integration and management research at Business Research Group in Newton, Mass. Besides beefing up security, the next wave of browsers will be much faster on lower-speed (read 9.6K bit/sec. and 14.4K bit/sec.) lines, he said.

Jay Batson, a senior analyst for the Network Strategy Service at Forrester Research, Inc., concurred and said browser vendors will be in a healthy battle for innovation during the next four or five quarters. "They'll be leapfrogging each other," he said, adding that the market will not consolidate until these innovations slow.

Gold mine

Given the expected onrush of new users, it is not surprising there is a gold rush in Internet access provider companies. These companies are springing up at the rate of 10% per month and driving the cost of Internet access down to $1 per day.

By some counts, 18 graphical Internet browsers will be available to consumers by the middle of this year.

Also watch for browser leaders such as Spyglass, Inc. in Savoy, Ill., Netscape Communications Corp. in Mountain View, Calif., and Spry, Inc in Seattle to push new and novel distribution models and strategic alliances as they try to put their client tools into as many hands as possible.

More alliances

While browser vendors do battle, the coming year will also witness the inclusion of browser capabilities into mainstream operating systems (IBM's OS/2 Warp, Microsoft Corp.'s Windows 95 and Digital Equipment Corp.'s OpenVMS). Similar activity will occur at the workgroup level (Lotus Development Corp.'s Notes) as well as with database software vendors.

Most notably, 1995 will be characterized by a rush of alliances among networking companies, including the long distance, cable and local telephone companies, makers of browser software and providers of information content and services.

Networking on exhibit at museum

By Erin Callaway

There is nothing like walking right through the guts of a giant computer to make you realize the enormous impact technology has on your life.

That is exactly the feeling visitors get standing in front of the oversized CPU in the giant walk-through computer at The Computer Museum in Boston. But it is the museum's new interactive Networked Planet exhibit that drives home to seasoned users and technophobes alike the power of not just one CPU but millions, hooked together on the information superhighway.

The Networked Planet exhibit *emphasizes the technical basics behind networking and how it connects to the world*

With a notable absence of infobahn hype, the Networked Planet emphasizes the technical basics behind networking and how it connects the world today. But it also addresses different sides of many issues familiar to corporate users, such as telecommuting, computer security and privacy.

When visitors first log in to the exhibit, for example, they are asked to choose whether they want their online profiles to be public or private. On-line guides present them with arguments for and against each choice.

"We intentionally made it tempting to make your information public so people will learn that there is a privacy trade-off when you join computer networks," said David Greschler, director of exhibits. "If you want to know more about others, you have to tell more about yourself. We make them face that issue head-on."

Day-to-day networking

On-line guides ease less-familiar visitors into the basics of computer networking by showing them how it is used to run systems they interact with every day, such as the telephone system, automatic teller machines and bar-code readers in supermarkets.

"We want people to realize that networks are based on things they are extremely comfortable with. Most people don't understand what a huge role computer networking plays in their daily lives," Greschler said.

Other parts of the exhibit allow visitors to see real applications of the information superhighway, such as the live feed of up-to-the-minute stock information used on Wall Street. Another kiosk shows how networking is used in transportation, retail and other industries. And in the Global Banking Network area, visitors can participate in global investing by opening an imaginary account on the Society for Worldwide Interbank Financial Telecommunications, or SWIFT, system in Belgium.

"Even if people actually work with computer networking, the exhibit exposes them to a much greater breadth of how it's being used than they might know," Greschler said. "They tend to get so specialized that it's sometimes hard for them to appreciate the impact technology has on the way business is done — even their own."

Patrick B. Carney

Potholes in the infobahn

I wish someone would develop a software package that could track all of the agreements, alliances and ventures involving just about everybody and the various cable television, telephone and entertainment companies. Exactly what all of these alliances and partnerships will yield will take several years to discover. Worse yet, it could be that long before the public realizes that it has been sold the wrong bill of goods.

Don't get me wrong — I don't want to come off as one of those traditional information superhighway cynics. I believe this new information and technology era will introduce our society to many new lifestyles, occupations and conveniences.

With the cable TV and local phone companies already having a wire to most homes in America, the battle for each to provide the other's service is just beginning. Those who have been following this in the news have seen some breakthroughs regarding which company can offer what service. While this battle heats up and consumers get wrapped up in the propaganda and sensational promises, such as "competition" and "lower prices," they must be realistic.

Remember when the Justice Department broke up AT&T? Here we are 10 years later, and placing a call from a pay phone with my calling card is more difficult than retrieving my electronic mail from a hotel room. Will it be this difficult to watch HBO in the next few years? While the cable companies are eager to break into the phone and data communications market, are they really ready?

One stormy evening this past fall, we lost power to our house. Electricity was restored within a half hour, and everything was back to normal. Or was it? When we turned on the TV, I found that the cable was still out. In fact, the cable remained out until the next morning. Some of these organizations may not have the technical or human infrastructure in place to provide the level of service we have come to expect from local phone and electricity providers. Their development of such an infrastructure will require a significant investment, and you and I will have to be those investors.

Beyond surface benefits

Too much of the news surrounding the information superhighway is focused on movies on demand. While such capabilities will make many shut-ins happy and break video rental store owners, people must keep in mind the other significant benefits and uses.

> Too much of the news surrounding the information superhighway is focused on movies on demand.

The medical and education communities, for example, look to reap huge rewards from such a technology infrastructure. The ability to transfer and access medical information instantaneously can be a great benefit to doctors and their patients. The educational ramifications and the capability to speed research efforts exponentially are also great promises that must not be forgotten.

So here I am with my new interactive TV, complete with a new set-top box, mouse control, a 486 chip tucked behind the 35-in. display, and as I sit down to channel-surf through the 250 new channels I now have thanks to this information superhighway, what do I see? It's the latest on the O. J. Simpson trial on 150 of the 250 channels.

Of the 50 or 60 cable channels you now have, have you noticed how many of them televise shows from 10, 20 or even 30 years ago? Where is the creativity and originality that separates our society from the rest of the world?

The transitional era we are now in should serve as a wake-up call to the entertainment and information industries. They must focus on creative new programs and increase value to their customers. If the highway architects improve their focus on the consumer and the value provided to the consumer, we can get past these potholes to enjoy a smooth ride.

Carney is director of IS for ABB Power Generation, Inc. in North Brunswick, N.J. He can be reached on CompuServe at 74250,3617.

Video app to run on ATM

By Suruchi Mohan

■ Insoft, Inc. and Newbridge Networks Corp. recently signed an agreement to introduce a videoconferencing application that runs on an Asynchronous Transfer Mode (ATM) network.

Although the announcement is important because it will bring to market an ATM product and application — Insoft's Communique — by the end of the first quarter, analysts do not see this as the clearing of a major hurdle toward the adoption of videoconferencing technology.

"There is no rocket science involved in doing video over ATM," said Tom Nolle, president of CIMI Corp. in Voorhees, N.J. Having an application that runs on ATM is not a major issue "because no one has ATM to do video over," he said.

Not that people are uninterested in ATM, quite the contrary. In a study of 150 Fortune 1,000 companies, Melinda Le Baron, research director at Gartner Group, Inc. in Santa Clara, Calif., found that for backbone solutions, most users wanted ATM and Fiber Distributed Data Interface. "For interactive multimedia, ATM comes up every single time, and it's ATM to the desktop. I don't think it makes sense to put in a more tactical technology," she said.

But the bigger challenge right now is to install the ATM network, Nolle said. "ATM is a good LAN strategy, so it doesn't matter if anybody is doing video. Getting it in is a challenge."

One deterrent to bringing ATM into the enterprise — apart from the lack of products and applications — is cost. To run Insoft's videoconferencing application on Newbridge's ATM backbone, for example, will require an initial investment of $135,000, according to the company. This will include the workgroup switch, ridges (a hardware component that converts between shared media and ATM), system manager and route server. The videoconferencing equipment will be extra, starting at $3,495.

A matter of time

Many companies are positioning ATM as the ultimate goal, with technologies such as 100Base-VG and isochronous Ethernet (IsoENET) acting as transitions. But the utility of these transitional technologies is still open to debate.

"IsoENET lets you use the existing infrastructure, but what's the point when you might change that," said Sarah Dickinson, program director and senior analyst at Personal Technology Research in Waltham, Mass. "It's cheaper to rip out the network and put in fiber, for example, and know you'll have it for 10 years."

Le Baron agreed. "Most customers don't know what IsoENET is or what it does," she said. The situation is the same for 100Base-VG.

A move to ATM is just a matter of time, but videoconferencing as a desktop application is still not ready for prime time. Quality video is important in applications such as training on assembly lines and in surgery, said Richard Doherty, director of Envisioneering Group, Inc. in Seaford, N.Y. "That is where the higher solution LAN solution will come in."

Unix security

CONTINUED FROM PAGE 57

result of bad passwords," said John Wack, a computer scientist and security specialist at the National Institute of Standards and Technology. "Now [the leading cause] is the failure to apply known [software] patches."

However, Wack said getting and installing all the needed patches in a timely way is not easy, especially for those who are not Unix wizards.

"People are sometimes reluctant to make changes for fear they'll mess up something and the systems won't work anymore," said L. Dain Gary, operations manager at the CERT Coordination Center. Gary said new tools that aid productivity also may make security more difficult by masking flaws.

But one user sounded a guardedly optimistic note about the computer security war. "The good guys are catching up, but the bad guys are still winning," said Dave Curry, manager of the Unix Systems Programming Group for Purdue University's Engineering Computer Network. "Part of the problem is there are so many of them and there are so many hosts to police."

Recommended NFS security measures

1. **FILTER PACKETS USING A FIREWALL OR ROUTER.** This will prevent access to NFS at your site from outside your firewall, but it will not protect you from attacks launched from your local network.
2. **USE A PORTMAPPER THAT DISALLOWS PROXY ACCESS.** This will protect hosts from attacks that originate inside or outside your firewall. A portmapper that disallows proxy access is available by anonymous file transfer protocol (FTP).
3. **INSTEAD OF A PORTMAPPER,** Sun Solaris users should install a special version of rpcbind available by anonymous FTP.
4. **CHECK THE CONFIGURATION OF YOUR /ETC/EXPORT FILES.** In particular, check the following:
   - Do not self-reference an NFS server in its own export file.
   - Do not allow the export file to contain a "localhost" entry.
   - Export file systems only to hosts that require them.
   - Export only to fully qualified host names.
   - Ensure that export lists do not exceed 256 characters. If you have aliases, the list should not exceed 256 characters after the aliases have been expanded.
   - Use the showmount (8) utility to check that exports are correct.
   - Wherever possible, mount file systems to be exported in read-only mode and export files systems in read-only mode.

Source: CERT Coordination Center, Software Engineering Institute, Carnegie Mellon University, Pittsburgh

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Xerox, Galileo adopt Unix-based big iron

Sequent tapped to guide Xerox's migration

By Mark Halper

Xerox Corp., which not long ago helped legitimize the notion that healthy companies can outsource information technology, recently broke another mold. It hired Sequent Computer Systems, Inc. to map out an enterprisewide distributed architecture and migration plan.

By tapping Sequent for a global consulting job inextricably linked to Xerox's massive Xerox 2000 business re-engineering project, the self-styled "document company" is trying to buck conventional wisdom that says product vendors cannot provide objective consulting services [CW, Dec. 12, 1994].

"I think you're always concerned about that, but we examined the degree of separation between Sequent's consulting and services group and its hardware group, and we concluded that we could get an objective viewpoint," said Larry Geisel, Xerox executive vice president of global solutions delivery.

Not alone

Xerox is not the first information systems shop to seek bias-free technology assistance from a hardware company. But the scope of the Sequent job should go a long way toward placing the stamp of approval on the burgeoning service practices of a multitude of product vendors, some users and analysts said.

The move also provides a glaring example that there is room for more than one outsider in an IS shop. Sequent arrived soon after Xerox handed over legacy systems and other IS responsibilities to Electronic Data Systems Corp. in a 10-year deal valued as high as $4.1 billion [CW, March 28, 1994].

Xerox, an $18 billion company, has asked Sequent to draw blueprints for a three-tiered Unix-based environment. Virtually all operations except corporate accounting will move off EDS-run mainframes during the next five years, Geisel said. In place of the mainframes will be huge Unix servers with the parallelism required to support large corporate databases (see chart).

The six-month contract, which one source valued at $1.1 million, also gives Sequent some early implementation responsibilities. Xerox has the option to extend the contract.

Some users said they remain wary of handing over broad directional responsibilities to any product-linked vendor because of implicit product biases.

"I don't believe we would pick a traditional hardware company to help us develop a strategy because I don't think they would be able to provide the independence I'd be looking for," said Katherine Holland, chief information officer at Philadelphia Electric Co.

Different light?

Geisel said that although Sequent gear will be among the brands that Xerox evaluates, a Sequent selection is no fait accompli. "They might eventually sell us something, but it won't be as a result of this [consulting] arrangement," he noted.

Holland found that hard to believe. "If they're starting out with [Sequent], does it logically follow that they would then say 'We're going to use HP or Sun?' Does the possibility exist? Absolutely. But I'd bet money the decision has been made, whether they

Xerox, *page 68*

X marks the spot

XEROX'S DISTRIBUTED TOPOLOGY WILL INCLUDE THREE HARDWARE LAYERS CONNECTED WITH NOVELL'S NETWARE LANS AND X.400 WIDE-AREA SWITCHING

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3) About 72,000 desktop machines

*Xerox has not selected hardware brands for its servers, desktop machines or X.400 equipment.

The big picture

The Xerox 2000 re-engineering plan targets improvements in four fundamental areas: time to market with new products, integration of suppliers with Xerox customer and manufacturing needs, payment collection time and customer service.

Speeding application development is Galileo's main goal

By Craig Stedman

Galileo International likes its mainframes, and it has a lot to like — 23 all told, running every facet of its big airplane, car and hotel reservation systems. But the company is about to give high-end Unix hardware a chance to steal some of its affections.

Hoping to speed up application development and save some money in the process, Galileo plans to open the doors of its Englewood, Colo., data center to Unix in the first quarter. Information systems executives there said they are close to choosing a Unix symmetrical multiprocessor (SMP) that will take over the airline passenger records application.

Galileo, which processes more than 66 million transactions per day for 33,000 travel agencies worldwide, also is rewriting its ticket production application with an eye on moving that to a Unix system within two years, the executives said. Additional functions may also be offloaded, including the company's fare system and a program that handles changes in flight schedules.

Mainframe not forgotten

Galileo is by no means giving up on the traditional mainframe. It recently completed a multiyear project to upgrade its core reservation systems to the most recent release of IBM's Transaction Processing Facility (TPF) operating system, which runs on 19 of the 3090-class mainframes in Englewood. The reservation functions will stay right where they are for now, in part because the company does not yet trust Unix to handle heavy transaction-processing workloads.

Galileo's Chris Skeadas *wants multiple technologies to coexist*

"TPF still has a critical role to play in the Galileo environment," said Chris Skeadas, Galileo's senior vice president of technical services. "Our challenge is to introduce Unix-based systems in a complementary fashion." Galileo's future strategy "is one in which multiple technologies coexist" while still providing mainframe-like service levels and reliability, he added.

Even that is a major change in IS philosophy for Galileo, which is owned by a consortium of 11 North American and European airlines. "We've basically been a very traditional glass house," said Jawaid Ekram, one of the architects of the mixed mainframe/Unix strategy. Ekram was director of systems and technology at Galileo until year's end, when he left to become senior vice president of operations and engineering at Visa International, Inc.

Galileo has some Unix machines in-house already, but they are isolated platforms that run a limited amount of systems and network management tasks, Ekram said. "They don't play in the big picture," he said. By contrast, the upcoming SMP box will have a central role as a mainframe equivalent.

The company expects to reap some hardware and software savings by embracing Unix, but Skeadas said its main goal is to reduce application development time by improving programmer productivity.

The company is looking for improvements of 30% to 50% in productivity compared with writing assembler code for mainframes, Ekram said. Development costs should also be lower than on the mainframe side because of the wider range of tools available for Unix machines, he added.

Ironically, the mainframe upgrade to TPF 4.1 may help make it easier to stir Unix systems into the Englewood mix. IBM added C and C++ language support to TPF 4.1, which will allow Galileo to rewrite an application once and then put it on either of the two platforms, Ekram said.

While Galileo will start out with a Unix SMP system, it is eventually expected to scale up to massively parallel processors, Ekram said. Two unidentified vendors are still competing for the initial order. Asked if one of the systems in the running is IBM's SP2 machine, Ekram said he would "plead the Fifth Amendment." Galileo already plans to start using an SP2 this month as a gateway processor, linking mainframes and other systems.

The passenger records application, which holds 13 months' worth of historical data, currently runs on an MVS mainframe with Computer Associates International, Inc.'s CA-IDMS database. It will still be accessed from TPF client terminals, but the information is being transferred to an Oracle Corp. database running with Novell, Inc.'s Tuxedo transaction monitor, Ekram said.

The application has already been rewritten in C and should be ready to go into production

Galileo, *page 70*

ON SITE

Galileo International
Englewood, Colo.

Goal: To speed up application development and lower programming costs in the transaction processing environment that runs the company's reservation systems.

Strategy: In the first quarter, to start putting high-end Unix multiprocessors into production to handle some of the applications now run on mainframes. To switch to C as the programming language of choice.

Results: Productivity increases are expected to be in the 30% to 50% range — excluding retraining time — for the first application that moves to Unix.

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Digital chief outlines plans for future growth

By Neal Weinberg

■ Digital Equipment Corp. plans to make a run at the mobile computing, Internet business service and interactive video marketplaces under the auspices of a newly formed Advanced Technology Group.

When the group was created in July, Digital's Chief Technology Officer William D. Strecker was charged with guiding the company's core competencies down new avenues.

The Digital approach is to take existing products, such as Alpha AXP-based servers, package them with Digital networking products and then team up with other vendors.

Strecker said that if specific product lines succeed, they will either become separate business units or fold into existing ones. Product lines will come and go, but the group will continue to develop new technologies, he said, including the Alpha-based video servers it introduced recently (see story at right).

Digital has opened a media studio in Tarrytown, N.Y. where customers can create programming for interactive video.

Up its sleeve

Strecker added that the group is working on a number of other projects, including intelligent agents for managing on-line information, navigational aids for the Internet and other forms of electronic interaction using speech, gestures and even facial expressions.

But whether Digital strikes gold with any or all of these ventures largely depends on how well the company executes the sales and marketing end of the business, analysts said. In fact, Strecker said the Advanced Technology Group was handed full responsibility for product development, sales and marketing. He would not say how much money Digital was investing in the group, but he called it "a nontrivial sum of money."

Even though Digital lost money in its latest quarter and is still laying people off — primarily in administration and sales — the company is maintaining a commitment to research and product development, according to analysts.

Strecker, who gave the keynote speech at the Digital Equipment Computer Users Society meeting, said that of the three areas, interactive video is the farthest along, Internet services are second, and the mobile computing business was just formed in September.

Digital's entry into these new markets is critical as the company searches for new revenue streams for its client/server products, said Brad Day, director of client/server computing at Dataquest, Inc. in Framingham, Mass.

Wes Melling, an analyst at Gartner Group, Inc. in Stamford, Conn., said Digital is making a name for itself in the video-on-demand marketplace because of its early wins. The company claims to have won about half of the trials and deployments of video-on-demand to date.

But in the context of a $13 billion company, interactive video revenue is not even a blip on the radar screen and probably will not be for years to come.

"It's certainly accurate to say this is an embryonic business for Digital," Strecker said.

Digital readies second line of media servers

By Neal Weinberg

Digital Equipment Corp. has announced a second generation of Alpha AXP-based media servers for interactive video — a market that could provide significant growth for the company, according to analysts.

Digital's first generation of media servers, introduced in the fall of 1993, was designed to help telephone and cable companies offer consumers video-on-demand and other services.

US West Communications, Inc. bought the servers for a proposed test in Omaha, while Nynex Corp. purchased them for trials in Rhode Island and Massachusetts. Both companies said they are still in the testing stage and will not offer interactive video to viewers until sometime in 1995. David Banks, a spokesman for US West Communications, said he envisions interactive video taking off this year.

The second-generation server, slated to be available in the first quarter, is based on the new 275-MHz Alpha processor. The server has improved connectivity features that offer lower cost per data stream, according to Digital.

"Alpha is as good a raw technology as any chip alive," said Brad Day, director of client/server computing at Dataquest, Inc. in Framingham, Mass. The question, Day said, is how much financial backing Digital gives the Video and Interactive Information Services unit.

Tom Maresca, an analyst at Jupiter Communications Co. in New York, a research and consulting firm specializing in consumer communications, said 62% of U.S. households will be wired for interactive video by the year 2003. "Lots of companies are certainly committing a lot of resources to it," Maresca said.

Xerox

CONTINUED FROM PAGE 63

[Xerox] realize it or not," she noted.

However, Holland said she might consider using consulting services from a product vendor on a project-by-project basis.

Geisel said EDS will be involved in implementing some of the changes that Sequent has mapped. But Xerox did not consider EDS to play the role of distributed architecture strategist, he said.

Xerox's Larry Geisel *believes Sequent can be objective*

EDS will continue to run mainframe operations, voice networks, systems procurement and the help desk for new and old systems, he said. It will also be free to bid on client/server developments on a case-by-case basis, Geisel noted.

With Xerox planning to move most operations off mainframes in the next five years, some analysts said EDS will have to win client/server projects if its 10-year outsourcing deal is to live up to its $4.1 billion potential.

An EDS spokesman said the company fully expects to help move Xerox to distributed systems and that the EDS/Xerox deal was never intended as an exclusive arrangement.

Steve McClellan, an outsourcing analyst at Merrill Lynch & Co., said, "You've got to give Xerox credit — they've done a lot of new and innovative things."

Briefs

Wang files suit

Wang Laboratories, Inc. has filed a lawsuit against Bootsector Industries, Inc., a Farmingdale, N.Y., firm that sells used equipment. Wang alleges that Bootsector is violating U.S. copyright laws by selling operating systems and applications based on Wang's VS midrange systems. Wang seeks a minimum of $100,000 in damages for alleged infringement plus punitive damages of $10 million.

IBM to build China lab

IBM plans to set up a research laboratory in China by midyear to develop technology for use primarily in that country. Included will be Chinese network services, I/O technology and speech and handwriting recognition capabilities, according to IBM. The laboratory, which will be staffed by about 15 employees, will also work on joint projects with Chinese universities and research institutes.

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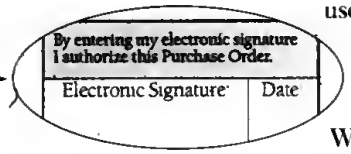

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Briefs

Sequent gets video nod

Sequent Computer Systems, Inc. said it is providing symmetrical multiprocessing Unix systems to **Bell Atlantic Corp.**'s Stargazer video-on-demand trials in northern Virginia. Stargazer is expected to provide service to 1,000 customers next year pending regulatory approval. The system combines Sequent's hardware with **Oracle Corp.**'s Media Server multimedia data and video software and Bell Atlantic's customer ordering and billing software. The deal came a month after BT's selection of Sequent systems for a video-on-demand trial for 2,500 subscribers in Colchester and Ipswich, England.

Airlines sign with Unisys

Unisys Corp. recently landed nearly $30 million in services and information technology contracts from several major airlines. **United Air Lines, Continental Airlines** and **Northwest Airlines** are upgrading their flight operations information systems with Unisys 2200 Series mainframes.

IBM sells English plant

IBM has sold its Havant, England, disk drive plant to the facility's management, which plans to expand its efforts to find customers other than IBM.

Amdahl ships Solaris software

Amdahl Corp. and **Sun Microsystems Computer Corp.** said they have shipped Amdahl's A+Edition 1.1 performance-tuning software for Sun's Solaris 2.4 operating system. The A+Edition 1.0 software, announced this fall, was designed to boost performance of Sun's SPARCserver 1000 and SPARCcenter 2000 symmetrical multiprocessing servers running Solaris 2.3. Prices range from $1,500 to $2,500 per CPU, the companies said. Users of A+Edition 1.0 will receive a free upgrade.

Westinghouse signs deal

Westinghouse Electronic Systems' Imaging and Data Systems Division in Baltimore has signed a $56 million deal to automate 98 general mail facilities for the **U.S. Postal Service**. This is the second phase of a three-part program awarded to Westinghouse in 1991.

Unisys extends Lifeline

The city of Columbia, S.C., has signed a $1.2 million contract with **Unisys Corp.** for the vendor's Lifeline Computer-Aided Dispatch system. The city plans to use it for emergency police and fire services. Under a separate agreement, Unisys landed a $1.3 million contract with **Pierce County, Wash.,** for similar systems.

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CD/1-9

Galileo

CONTINUED FROM PAGE 63

"almost immediately" after the hardware decision is made, according to Ekram.

Passenger records was chosen as a starting point because it is a stand-alone application that could be done "without using too many resources," he said. "It's also one that is not really mission-critical."

Charlie Burns, an analyst at Gartner Group, Inc. in Stamford, Conn., said bringing Unix into big transaction-processing environments is "not something that a lot of people are actively doing." But Galileo appears to have adopted "a rational way to go about it," he noted. "Things like passenger records and ticketing don't really need a mainframe."

From within

Galileo is retraining its mainframe programmers to write Unix applications rather than hiring from outside, said Jawaid Ekram, until recently the director of systems and technology at the company. About 25% of Galileo's 800-plus programmers have received C language training thus far, he noted. Ekram said it is taking employees about three months to get up to speed on Unix, twice as long as Galileo had expected.

Design Data Systems Corp. has announced SQL Time Inventory Management, a module in Design Data's SQL Time Distribution product line.

According to the Largo, Fla., firm, SQL Time Inventory Management provides instant response to multiwarehouse movement, stock/nonstock availability and intelligent replenishment methods.

The product includes Gordon Graham controls for freezing stock, usage/movement overrides and seasonal ordering.

Pricing starts at $4,800 for an eight-user license.

▶ *Design Data Systems*
(813) 539-1077

Apertus Technologies, Inc. has announced the TN5250 Server Option for its Datastar/DataCenter Hub.

According to the Eden Prairie, Minn., company, the TN5250 Server Option adds connectivity to IBM AS/400 systems from TCP/IP networks supporting TN5250 clients.

The Datastar/DataCenter Hub then acts as a Telnet, TN3270 and TN5250 server that interconnects TCP/IP-based networks with AS/400 applications.

Prices start at $13,559.

▶ *Apertus Technologies*
(612) 828-0300

Cray Research, Inc. has announced Cray Animation Theater.

According to the Eagan, Minn., firm, Cray Animation Theater uses massively parallel processing to create computer visualizations and animations of problems too large for graphics workstations.

The software runs on Cray T3D systems linked to Digital Equipment Corp. or Silicon Graphics, Inc. workstations.

Prices start at $8,000, depending on the size of the Cray T3D host.

▶ *Cray Research*
(612) 683-7100

MacKinney Systems has announced Adhoc Report Writer.

According to the Springfield, Mo., company, Adhoc Report Writer provides CICS menu screens to guide users through selected files and fields and lets users view output before printing.

The product builds files of selected data, reads Cobol file definitions to build a data dictionary, uses multiple related files to build reports and handles multiple record types in one file.

Adhoc Report Writer costs $1,995.

▶ *MacKinney Systems*
(417) 882-8012

4th Dimension Software Ltd. has announced Control-V, media-independent report archiving software for mainframes.

According to the Irvine, Calif., company, Control-V lets users replace computer output microfiche for report retrieval and specify a report's media migration path from beginning to end.

Report editing features include freezing headers and columns, including or excluding report lines and highlighting data.

Prices start at $35,000, depending on CPU.

▶ *4th Dimension Software*
(714) 763-4300

WinGate Technologies has announced WinTunnel, Windows integration software for DOS and mainframe applications.

According to the Morristown, N.J., company, WinTunnel lets DOS and host application users automatically merge their data with Windows documents with the touch of a hot key. It can also merge multiple records and create multiple Windows documents in a single process.

WinTunnel costs $49.

▶ *WinGate Technologies*
(201) 539-2727

Walker Richer & Quinn, Inc. has announced Reflection for the AS/400, PC-to-IBM AS/400 connectivity software.

According to the Seattle company, Reflection for the AS/400 has the look and feel of a Windows application, making the AS/400 more intuitive for end users.

Features include a Microsoft Corp. Excel-style tool bar, graphical keyboard mapping, color configuration, file transfer and hot spots.

Reflection for the AS/400 costs $349.

▶ *Walker Richer & Quinn*
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OBJECT RELEASE GIVES DEVELOPERS ELBOW ROOM, 76

Oracle, Sybase embrace multimedia databases

By Kim S. Nash

"Multimedia database" will never be a household term. Not if Oracle Corp. and Sybase, Inc. can help it.

These relational database leaders want to provide the technology that makes consumer applications such as interactive game shows and movies on demand possible. But Oracle and Sybase do not care whether Helen Homeviewer ever knows that their databases also make it possible for her to view and order the *History of Cubic Zirconia* video she saw on her favorite home shopping show.

While Sybase and Oracle toil with local telephone and cable companies to launch such interactive television systems for consumers, information systems shops are expected to turn their attention to multimedia databases this year, users and analysts said.

Additional applications

The business pull is expected to strengthen in 1995 in several areas, particularly for applications such as computer-based training, desktop videoconferencing and kiosks and other systems that give customers direct access to a company, according to Rick van der Lans, a director at R20/Consultancy B.V. in The Hague, the Netherlands.

Yet neither Oracle nor Sybase can satisfy performance and capability demands for such applications with their relational offerings, according to van der Lans.

The complexity of the information being stored and the questions being posed are the two major factors that separate multimedia database applications from those for relational databases.

"Checking stock price changes," he noted, "is a lot less complicated than asking [a database], 'Can I land a helicopter on a specific oil rig?' "

Multimedia databases, van der Lans said, must be able to do the following:

- Contain any combination of graphics, sound, animation or video.
- Store, retrieve and manipulate that data.
- Read and write information to and from both magnetic and optical discs.

Multimedia = big data

- 150 seconds of music equals 25M bytes.
- A typical music CD equals 650M to 700M bytes.
- An average 90-minute movie equals 128G bytes.

Oracle 7 and Sybase System 10 have yet to hit all those marks, he said. For example, neither database can store data directly to optical discs.

Meanwhile, both companies are building products — based on their respective relational databases — designed to handle video, images and so on. Sybase's Intermedia database is due out before June, but early versions have been tested at Hewlett-Packard Co. and Silicon Graphics, Inc. Sybase will ship Gain interplay and Gain Momentum authoring tools with Intermedia.

Oracle's Media Server, announced a year ago next month, is due for general availability to IS shops in March. Media Server will come in several pieces, including separate video and text servers, Oracle said. Media Server will be sold with Media Objects, a $495 set of scripting tools.

Yet it may be attitude more than product prowess that is most important to IS managers embarking on multimedia applications. For example, Southern New England Telephone (SNET) recently chose Sybase over Oracle as the database core for an interactive TV application to be designed for 150,000 homes this year.

"At this point, there is no [database] of the class we need that's what you would call finished. Going with any vendor for this [contract] would have required a leap of faith," said Bruce Jacobson, technology director at SNET's multimedia group

Sybase's responsiveness to SNET's questions and "good understanding of the problems" inherent in multimedia applications helped it edge out Oracle, Jacobson said.

Oracle has won contracts with Bell Atlantic and several other regional Bell operating companies for similar interactive pilots.

Intersolv brushes off mainframe image

By Rosemary Cafasso

Intersolv, Inc. in Rockville, Md., finished off 1994 with another move to rid itself of its lingering old-world mainframe image. This time it released a revamped APS for Client/Server development platform that users said has improved graphics functions and better overall performance.

Company officials also said Intersolv plans to add additional programming language support to APS for Client/Server soon so users can generate C++ code and eventually C code. APS currently generates Cobol code.

"That's very important," said Beth Ouellette, an APS for Client/Server Version 3.1 beta tester and technical manager in the software engineering technologies group at Metropolitan Life Insurance Co. in New York. The company has users on Windows and OS/2 machines. "I need to generate code for either platform," she said.

APS for Client/Server is currently installed at approximately 1,600 user sites. With other development and configuration management tools, Intersolv has about 14,000 customers altogether.

Larger audience

Analysts said Version 3.1 could help Intersolv broaden its appeal with client/server developers.

"This is clearly something they have to do,"

Intersolv, *page 76*

Microsoft to ship Windows 95 tools

By Stuart J. Johnston

Users applauded Microsoft Corp.'s plans to ship Windows 95 versions of its major development tools within 90 days of delivering the new 32-bit operating system.

On the burner and set for delivery within three months after Windows 95 ships, are Windows 95-specific versions of the Access and FoxPro database development tools as well as new versions of Visual Basic and Visual C++ [CW, Dec. 19], according to Roger Heinen, senior vice president of Microsoft's Developer division.

He added that it is "possible" Microsoft could ship some of these products even before the operating system is generally available but declined to provide specific delivery dates or features included with the development tools.

Users generally hailed the idea that Microsoft is not neglecting what might otherwise be considered ancillary products for a new platform.

Just what is needed

"I'm frankly a little surprised [a Windows 95 version of Access will be available so soon], but I'm happy because it will help us with our Access testing efforts," said Bill Cornfield, president of The Windows Support Group, a consultancy in New York. Access is Microsoft's general-purpose desktop database product.

"I didn't realize they were that close" to shipping Access and Visual C++ for Windows 95, said John Berting, manager of software engineering at Rheometric Scientific, Inc. in Piscataway, N.J. "I think having Office with Access will be a big advantage for us [and will provide] the full comforts of Windows 95, not the least of which is pre-emption," he added.

"I think the one [product] I'd be excited about would be Access because a 32-bit Access would be very cool, but I don't think it will be out in the time frame they're saying," said Ed Staffin, vice president of Impact Software, Inc. in Palatine, Ill.

Berting also noted that the current Version 2.0 of Visual C++ can be used to write Windows 95 applications but that it lacks the shortcuts, called Wizards, that give developers direct access to Windows 95 features. The next version of Visual C++ will feature "much more complete Microsoft Foundation Classes" for Windows 95 development, Heinen said.

In terms of a Windows 95 version of Visual C++, "that means we can have people doing development just under Windows 95" instead of developing under Windows NT and having to reboot the machine under Windows 95 to test the code, Cornfield said.

While Heinen would not disclose actual features in the forthcoming products, he said they will support important Windows 95 features, specifically 32-bit pre-emptive multitasking, multithreaded execution and long file names as well as the user interface. He also said Visual Basic, Applications Edition, which is the common macro language for Microsoft applications and is included in Excel, will be updated to support Windows 95.

Probably first to appear will be FoxPro 3.0. "We're about to announce FoxPro 3.0," Heinen said, adding that it is currently being beta-tested.

A major update to the SQL Server database management system is also planned for release early this year, Heinen said. SQL Server 95 will have improved support of symmetrical multiprocessing, sport better systems management features and add replication services.

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Object release gives developers elbow room

By Tim Ouellette

■ Early users of ObjectSystems, a C++ class library, say they are enjoying a tool that helps simplify object-oriented programming for Unix.

The product, from ObjectSpace, Inc. in Dallas, provides an object layer between the application and Unix. The object layer handles systems calls and error detection.

ObjectSystems includes 120 classes and supports Sun Microsystems, Inc.'s SunOS 4.x and SunOS 5.x/Solaris 2.x, Hewlett-Packard Co.'s HP/UX 9.x, IBM's AIX and the Open Software Foundation's OSF/1.

"It's really an extended base class," said Bob Hood, a software engineer at Evolving Systems, Inc., a software vendor in Englewood, Colo. Among the key features is an interprocess communications (IPC) suite "so you can access other things as objects," Hood said.

The IPC suite lets individual parts of a program communicate with one another. Users do not have to learn the numerous IPC-specific Unix systems calls because they are hidden behind the product's interface.

A related feature of the product is object transport, which lets users send objects over any Unix IPC mechanism or store the object persistently. Persistence allows for objects to be read into an object of the same class for future retrieval.

Quick fix

Ed Tischofer, technical staff leader at Alcatel Network Systems, Inc. in Richardson, Texas, said he uses ObjectSystems solely for the IPC suite. Although Tischofer said he expected a steep learning curve, Alcatel developers quickly integrated the library into their network management project. "We are now passing our own customized objects back and forth," he said.

Norman Wong, a systems design consultant at Kenlen International in Edison, N.J., agreed that the product is easy to use for Unix calls that are often very cryptic.

"It seems to me that ObjectSystems offers a very simple approach that is easy to use," he said. Most object libraries "don't have this simple approach that lets users implement applications with the library," he added.

ObjectSpace promotes the product's use as either a stand-alone product or in conjunction with Rogue Wave Software, Inc.'s Rogue Wave Tools.h++. "It depends on what you are doing," said Hugh Bisbop, an analyst at Aberdeen Group in Boston. "ObjectSystems will overlap with some other products that are entrenched."

At $875 per seat, ObjectSystems costs approximately twice as much as Rogue Wave Tools.h++, but some users said ObjectSystems provides more functionality.

New products

Separately, ObjectSpace also announced three related products for both Smalltalk and C++ Unix developers. Available now, ObjectSockets is a Smalltalk class library for TCP/IP communications, and ObjectMetrics gathers metrics about Smalltalk objects.

ObjectCatalog, available in early 1995, allows C++ and Smalltalk objects to be reused. Bishop said ObjectCatalog will be the most valuable of the four once it is released. "The ability to find objects within a system, find what they do and how they can be used is critical, especially when you go beyond two developers," he said.

Intersolv

CONTINUED FROM PAGE 73

said Judith Hurwitz, president of Hurwitz Consulting Group, Inc. in Watertown, Mass. "They have a large installed base, primarily of customers who are host-centric. So if they can help them move into client/server, then they can hold on to that installed base."

Some APS for Client/Server users said the additional graphics functions are a big boost.

"It's come a long, long way," Ouellette said of APS, which Metropolitan Life began using in 1989. "The development environment used to be very text-based. Now it's really graphical, with drag and drop, point and click."

Speeding it up

In addition, early users said the redesigned code generator is showing some substantial performance gains.

Toma Fisher, a computer-aided software engineering tools administrator at USAble Systems, Inc., a developer of health care software in Little Rock, Ark., said the new generator recently produced a chunk of code in 45 minutes. It would have taken the previous release of APS about two hours to produce a comparable amount of code, Fisher said.

Version 3.1 will generate client code for either Windows, 3.1 or OS/2. It supports several databases, including IBM's DB2, DB2/2, IMS and VSAM as well as systems from Oracle Corp. and Sybase, Inc.

The software carries a per-user license fee of $4,000.

[redacted]

Premia Corp. has announced Codewright Fusion, a code editing system that integrates with Microsoft Corp.'s Visual C++.

According to the Portland, Ore., company, Codewright Fusion was designed to increase code editing efficiency by providing programming automation within Visual C++.

Features include multiple file and project search and replace, a selective display mode for views of relevant information, a hex mode, user-defined color scheming and a spell checker.

Codewright Fusion costs $149.

▶ *Premia*
(503) 641-6000

MetaWare, Inc. has announced High C/C++ Compiler for Windows and Extended DOS 3.3, a globally optimizing 32-bit compiler.

According to the Santa Cruz, Calif., company, High C/C++ Compiler for Windows and Extended DOS 3.3 provide common support for templates, virtual function tables and in-line functions.

MetaWare's source-level debugger and Rogue Wave Software, Inc.'s Rogue Wave Tools.h++ are included with the product.

High C/C++ Compiler for Windows and Extended DOS 3.3 cost $795.

▶ *MetaWare*
(408) 429-6382

ACI US, Inc. has announced Object Master for Windows, a C/C++ programming tool.

According to the Cupertino, Calif., company, Object Master for Windows lets users write, edit, organize and navigate source code while using Windows functions.

Features include a source code editor, a project window, a browser and a class tree window for object programmers. The product parses each file as it is added to a project and lets users view the project structurally and display components while working on specific pieces of code.

Object Master for Windows costs $249.

▶ *ACI US*
(408) 252-4444

Asta, Inc. has announced the Safe C Runtime Analyzer, automated software analysis software.

According to the Nashua, N.H., company, the Safe C Runtime Analyzer detects runtime errors, identifies test coverage and performance bottlenecks and understands program control flow.

A dynamic tracing feature lets developers view the behavior of applications during execution by displaying an execution history. Runtime errors detected by the product include memory leaks, stray pointers and static and dynamic boundary errors.

Prices start at $1,200.

▶ *Asta*
(603) 889-2230

ViewPoint Technologies, Inc. has announced SourceWorks/VB, version control software for Microsoft Corp. Visual Basic group development.

According to the Sherborn, Mass., company, SourceWorks/VB provides developers with simultaneous read/write access to all files while preventing the overwrite of any source file.

Features include Visual Basic-sensitive differencing to flag revisions of files, tracking of all files in a project and no requirement for a systems administrator.

SourceWorks/VB costs $295.

▶ *ViewPoint Technologies*
(508) 655-9595

Greenbrier & Russet Software has announced RPCPainter, an integration framework that links Powersoft Corp.'s PowerBuilder with Open Environment Corp.'s development tools.

According to the Schaumberg, Ill., company, RPCPainter lets PowerBuilder developers create enterprisewide client/server applications using a three-tiered architecture.

The product uses remote procedure call (RPC) technology that lets business logic be implemented in server procedures using widely used programming languages, freeing applications from just using SQL. Features include automatic generation of RPC stubs for the server and RPC objects in a PowerBuilder library, automatic population of DataWindows with RPC results and automatic upload of DataWindows changes through RPCs.

RPCPainter costs $19,120 with Open Environment's tool kit.

▶ *Greenbrier & Russet*
(708) 706-4000

Micro Focus, Inc. has announced Micro Focus Embedded SQL Toolkit for Microsoft Corp.'s SQL Server.

According to the Palo Alto, Calif., company, Micro Focus Embedded SQL Toolkit for SQL Server lets developers include SQL statements directly in Cobol source code.

The product provides an interface to Micro Focus compilers and development and runtime libraries for SQL Server.

Micro Focus Embedded SQL Toolkit for SQL Server costs $400.

▶ *Micro Focus*
(415) 856-4161

Fleet & Partners, Inc. has announced Benchmark Plus 2.5, visual process analysis and modeling software.

According to the Richford, Vt., company, Benchmark Plus 2.5 includes a Process Map capability, flowcharting software importing and tag setting capabilities.

Other features include a repository of activities and standards, a blueprint that displays total process cycle time and fishbone diagrams for cause-and-effect assessment.

Benchmark Plus 2.5 costs $690

▶ *Fleet & Partners*
(905) 855-9095

INSIDE:
WANT REAL ANSWERS FROM YOUR CEO? ASK BETTER QUESTIONS!
— PAGE 84

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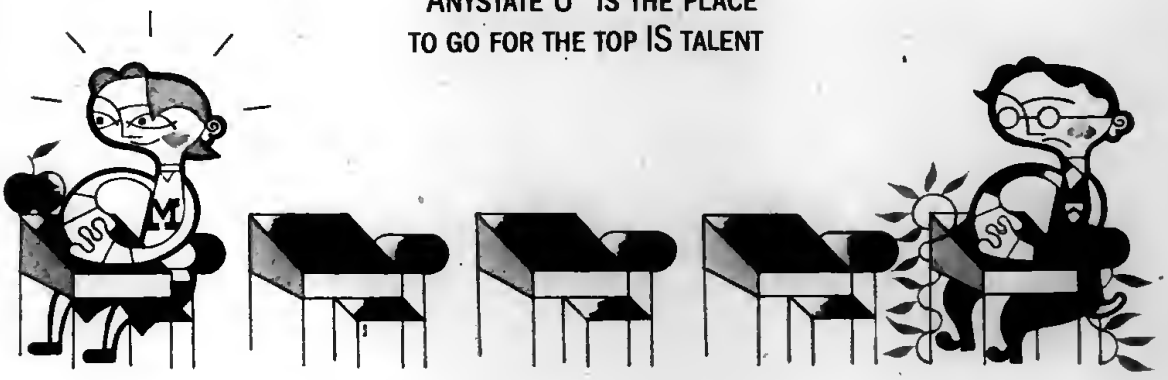
FORGET THE IVY LEAGUE AND THE TOP TECH SCHOOLS — "ANYSTATE U" IS THE PLACE TO GO FOR THE TOP IS TALENT



Looking to hire the best information systems talent coming from America's colleges and universities?

By Alan R. Earls

Interviews with campus recruiters at 25 major systems integrator organizations — the firms that recruit the largest numbers of new graduates into the information systems field — show that you don't have to line up at the nearest Ivy League school. Nor do you have to make a beeline for traditional "tech" schools. Recruiters say you can find the right mixture of basic technical and business skills — and work experience — closer to home.

The beneficiaries are often students at schools such as the University of Virginia and the University of Maryland, which the recruiters we polled named No. 1 and No. 3 in IS, respectively.

As America's major IS organizations grapple with change, campus recruiters are recalibrating their criteria for future employees. One recruiter notes, "It isn't just pure [information technology] work. Now we need people to solve complicated business problems." That, combined with a desire to control costs, has driven recruiters into the arms of schools in their regions and, occasionally, to a handful of schools they believe have "the right stuff" when a position requires a purely technical focus.

In the past, a school's perceived prestige was enough to please many recruiters and garner a student a job offer. Today, however, recruiters take a dollars-and-cents approach to the whole process.

In practice, that means many have come to favor reliable sources in their own backyard, perhaps a local state college or university. And that backyard has come to mean primarily East Coast schools because that is where recruiters say the IS job market is stronger.

Recruiters will bid against one another for the limited number of top specialists, or individuals with hard-to-find skills, at nationally ranked schools.

What's more, recruiters are demanding and getting an unprecedented level of real-world experience in their new hires. That, plus proof that students are being exposed to business ideas and the latest technologies, is the calculus du jour for today's colleges. The colleges that are placing their graduates in the top jobs are the ones providing the right mix — even if they lack the name recognition some schools enjoy.

Head of the class, *page 80*

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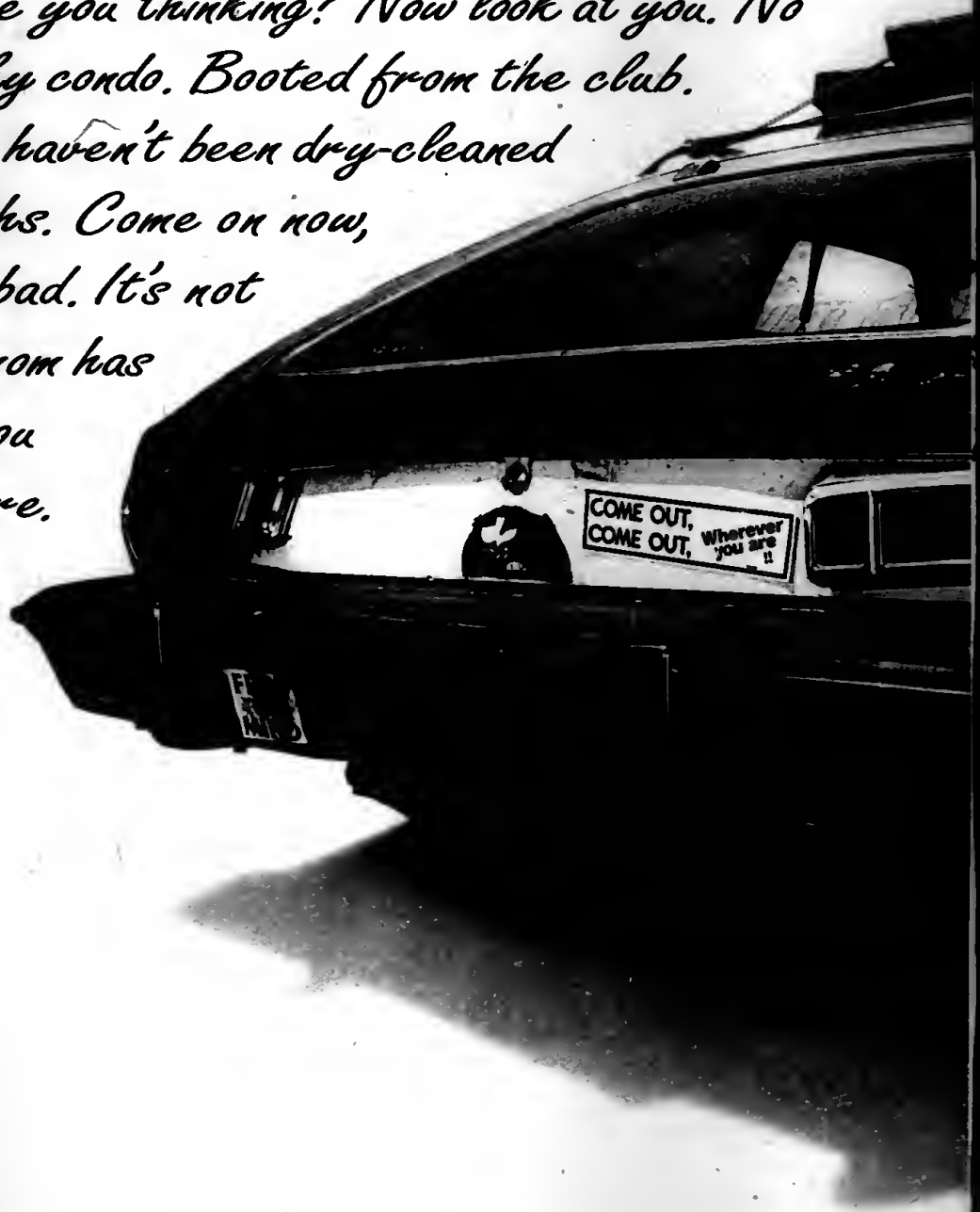

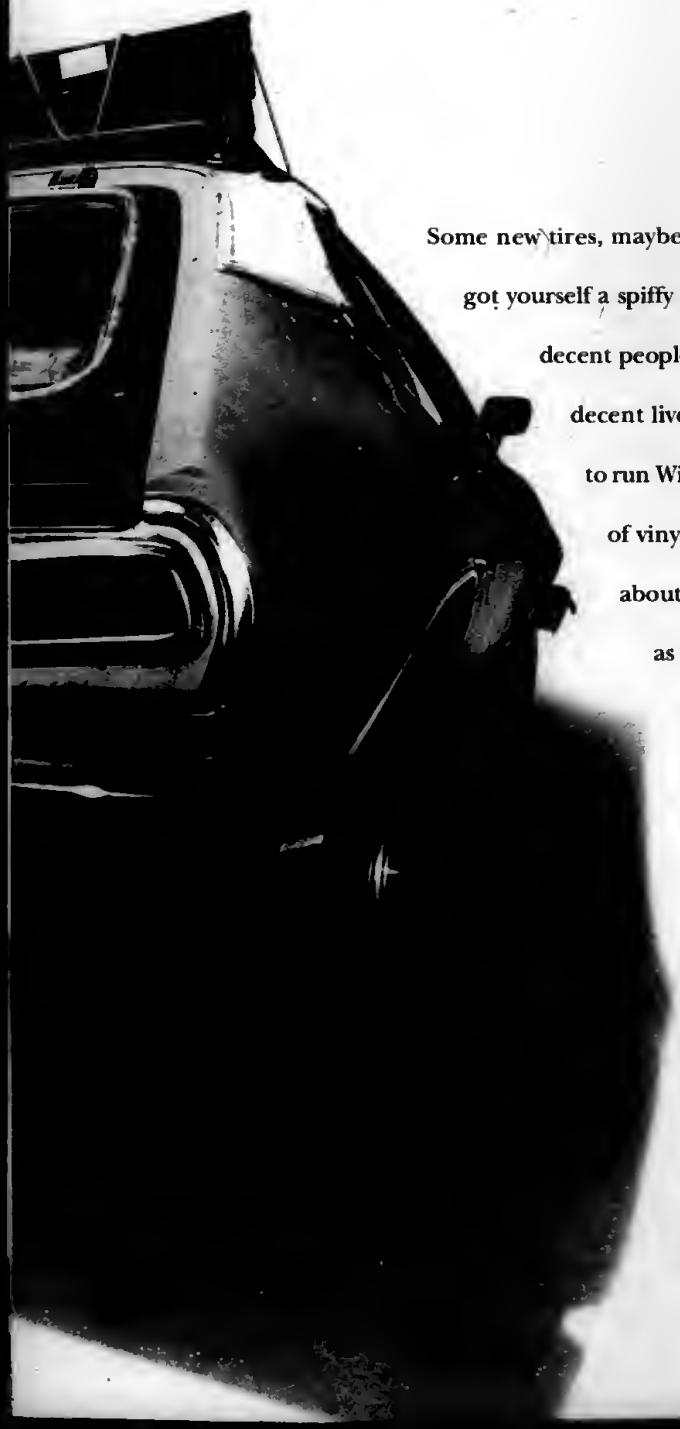

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CONTINUED FROM PAGE 77

TOP DOGS

Which schools are seen as the top of the heap? In a telephone survey of 25 of the largest national systems integrators, recruiters shared their secrets — what their favorite schools are and what they think it takes to be a top school. All requested their responses be kept anonymous.

Among the Top 10 derived from those responses, only three schools were truly "national" favorites — picked because of their strong technical reputations and *despite* not being local to hiring needs.

That trinity included the University of Southern California campuses, Rensselaer Polytechnic Institute (RPI) in Troy, N.Y., and Carnegie Mellon University in Pittsburgh. These schools received especially high marks for technical courses. But for almost all of the recruiters, technical qualities were but a part of the equation. For example, one recruiter favored RPI for its orientation toward cooperative education programs and its academic strengths.

In addition to finding technical and business skills, many recruiters say they also focus on meeting corporate diversity goals — especially racial diversity. Indeed, a number of firms indicated that the only hiring they currently do on campus is focused on gaining greater minority representation in the workforce.

That, combined with a strong IS program, helped put Howard University in Washington into the Top 10. Morehouse College and Spelman College, two other traditionally all-black colleges, were also named frequently by recruiters, though much less often than Howard.

Finally, there is location, location, location — the overwhelming multiplier for recruitment choices. Staying local cuts recruiting costs dramatically, says Carlos Eschalar, a recruiter at TRW Systems Integration in Fairfax, Va.

Recruiters can make on-campus trips for a day, instead of a week, and students can be brought to the workplace, sometimes without transportation or accommodation expenses. Eschalar says those who attend regional schools generally want to stay in the same area after graduation, a factor not lost on retention-conscious recruiters.

"IT ISN'T JUST PURE IT WORK. NOW WE NEED PEOPLE TO SOLVE COMPLICATED BUSINESS PROBLEMS."
— ANONYMOUS RECRUITER

"WE GO TO ABOUT 100 CAMPUSES EVERY YEAR. SOME SCHOOLS ARE CONSISTENTLY AT THE TOP OF OUR LIST BECAUSE THEY PROVIDE THE BEST QUALITY OF GRADUATES."
— PAUL ORVOS, COMPUTER SCIENCES CORP.

SITUATION NORMAL

Of course, many of these same issues and trade-offs have been weighed by companies for years. What is new, according to Maury Hannigan, a New York consultant who helps a variety of companies improve their overall recruiting process, is the fervor with which firms now seek to get bang for their buck from recruiting.

For example, when corporations used to regularly relocate employees, focusing on the "best" schools nationally made perfect sense. Now, though, the goal is often to meet a regional need — say expanding business in the Midwest or a resurgence in government business in the mid-Atlantic area.

Thus, recruiters now tend to make a special effort to target schools close to their facilities. And when they hire, they bank on their relationships — often with a state-run college or university — to fill the bulk of their needs.

"We go to about 100 campuses every year," says Paul Orvos, director of college relations at Computer Sciences Corp. in Falls Church, Va. The reason: Creating a regionally diversified company means shopping a lot of regional markets. But Orvos says that thanks to some especially well-developed relationships, a hare dozen of those schools will consistently provide almost 40% of new hires.

"Some schools are consistently at the top of our list because they provide the best quality of graduates," Orvos explains. Other recruiters report similar dichotomies between favorites and also-rans.

That favoritism, too, is typical. At some companies it is based on an admitted old-boy network.

"It's the people who have worked out best in the past" that lead recruiters back to alma maters, says Mike Katz, vice president at recruitment firm Booz Allen & Hamilton, Inc.

Other firms, though, take a different approach to reach the same goal.

"We have very objective criteria for evaluating schools," says Brent Inman, partner and national director of recruiting at Coopers & Lybrand. Objectivity includes evaluating the IS curriculum, looking at Scholastic Aptitude Test scores and grade point averages and then, finally, tracking past recruits through their careers at Coopers & Lybrand.

"We have found a statistically significant correlation between our top schools and the people who are most successful here," Inman says.

To the contrary, David L. Reed, national director of recruiting at Andersen Consulting, says, "We have found there was no statistical correlation between the school or the degree in terms of performance with us." For that reason, Reed says his recruitment efforts now focus on the individual more than the school.

Reed's disenchantment with "brand names" may be becoming pervasive.

"I know of a major employer in the Pacific Northwest that stopped recruiting at one of their favorite schools because they couldn't get anyone to listen to their request that students be given exposure to Visual Basic and C++," says Michael Forrest, executive director of the College Placement Council in Bethlehem, Pa., an organization of 1,500 employers and colleges set up to strengthen recruiting relationships. He says some of the preference being shown for graduates with work experience is based on a desire to pierce the veil of academic image and focus on demonstrated abilities.

"We still work on an 80-20 rule," says Chris Ryan, manager of campus relations at Electronic Data Systems Corp. in Virginia. The vast majority of recruits come from nearby schools and the balance from prestige schools. For Ryan, picking prestige schools is a mixture of personal experience, lore and "relying on rankings of colleges provided by published guidebooks such as Fiskes, Gorman and Barrons." ■

Earls is a freelance writer in Franklin, Mass.

TOP 10 IS school choices

[illegible]

COLLEGE OR UNIVERSITY	[illegible]	[illegible]
Carnegie Mellon University	Pittsburgh	[illegible]
Howard University	Washington	[illegible]
Purdue University	West Lafayette, Ind.	[illegible]
Rensselaer Polytechnic Institute	Troy, N.Y.	[illegible]
State University of New York	Albany, N.Y.	[illegible]
University of Maryland	College Park, Md.	[illegible]
University of Pennsylvania	Philadelphia	[illegible]
University of Southern California	Los Angeles	[illegible]
University of Virginia	Charlottesville, Va.	[illegible]
Virginia Polytechnic Institute	Blacksburg, Va.	[illegible]

Source: IS recruiters at major U.S. systems integrators

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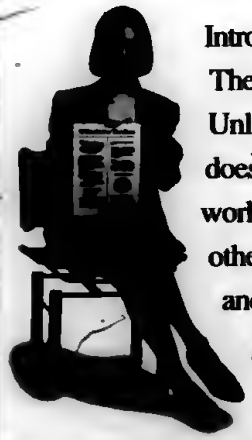

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Number of applications with on-the-fly spell checking	Four	
Automated tasks that work independent of applications	Yes	
Grammar checker can rewrite entire sentences	Yes	
Intelligent find and replace	Yes	
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Richard Koeller

Ask a better question

I had just come on board as the new CIO, and it was my first meeting with the CEO. After nearly an hour of discussion, he smiled and asked if I had any remaining questions about my new job.

"Only one," I replied. "What IS activities do you hold me accountable for?"

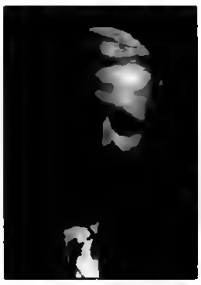
"All of them," replied the CEO. "I hold you accountable for all information technology successes and failures. I realize that you don't manage them all, but you're still accountable for them."

The CEO rose from his chair as he spoke, and I knew the meeting was over. After thanking him for his time and insights, I began the long walk back to my office. I had expected the CEO to ask me, "What do you think you should be accountable for?"

I would have responded that accountability and authority must be kept in balance. Instead, I had full accountability but only limited authority. No wonder CIO turnover was so high.

Several years later, I realized what went wrong that day. The problem was not the CEO's answer; it was my question.

I knew full well it was my responsibility to manage the complexities and interdependencies of IS, but I asked a question that implied the CEO was really responsible. In essence, I asked him to make my job easier than it really was. The only answer I was prepared to deal with was how big my job was, not how complex it was.



Why did I ask the wrong question? Because all of my prior management experience had been about control, not complexity — at least not of the political type in which I was now embroiled. I therefore thought I had somehow failed to explain the problem well enough to the CEO. It never dawned on me that I was working the wrong problem.

To prove that point, what did I do after my meeting with the CEO? I reviewed the meeting with my staff and a fellow CIO from another company who had the same dilemma. They were all sympathetic and wished me luck, but none of them was in a position to provide the help I needed.

I often think back to that meeting, that opportunity to get guidance and help, and wish I had asked the CEO a better question. If I could turn the clock back, what question would I ask?

First I had to understand better why I had asked the wrong question in the first place. In retrospect, it became obvious that my first mistake was to take too narrow a view of my job. I needed to view my role in a broader context — as an integral member of corporate senior management with responsibilities outside of information technology.

Even if I had realized that at the time, I don't think I would have known what to do differently. Where should I have gone for help? At that point I remembered a magazine article called "How to become a millionaire," written by billionaire J. Paul Getty many years ago. Getty opened by saying that you don't ask advice of someone who makes $10,000 a year.

In other words, don't do what I did after my meeting with the CEO. I discussed the problem at length with my staff, another CIO and my wife, all of whom were less experienced than I was at managing complexity. They were all sympathetic, but none of them was of any help at all. How could they be?

Let's stay with the analogy. Who should I have asked for advice? Who was the "millionaire" who had already achieved the goal I was aiming for? Any member of the executive committee would have been able to help, but I never thought to ask. I viewed my problem as an IS problem and thus tried to solve it in the same manner I had always solved IS problems.

Many of the dilemmas facing senior IS executives today are the direct result of business changes, not technological changes. Not only is the business world becoming more competitive and global in nature, the business role of IS is becoming more significant every day. IS managers must accept these changes and re-evaluate the underlying assumptions about how to manage the IS function.

If I had to do it over again, what question would I have asked?

Another chance

I would have made clear to the CEO that I already knew I was accountable for all IS activities and, in fact, would have it no other way. Then I would have asked for advice, not solutions. I would have asked him to point me in the right direction and, if necessary, provide some support. Specifically, I would have asked who on the staff was the best role model for me to learn from and would the CEO support that person's taking some time away from his job to help me with mine.

Second, based on input from the CEO, his recommended staff member and human resources, I would have developed and implemented a personal management development program with little or no IS content targeted at improving general management skills.

Finally, I would have asked the CEO to schedule another brief meeting with me in six months to give me feedback on my progress.

My advice to all CIOs in search of answers to really tough questions is this: Quit being disappointed in the answers you are receiving, and focus instead on asking better questions. ■

Koeller is president of Koeller & Associates, an IS management consultancy in Chicago.

Executive Track

Mentor Graphics Corp. in Wilsonville, Ore., has announced the appointment of **Doyle Baker** as vice president and chief information officer. In this newly created position, Baker will be responsible for the company's information services worldwide. He reports to Douglas Morby, senior vice president and chief financial officer. Prior to the appointment, Baker was director of information resources at Convex Computing Corp.

Safeway, Inc. in Oakland, Calif., has appointed **David T. Ching** senior vice president and CIO. He will oversee the company's recently reorganized information technology functions in the U.S. and Canada. He will report to Julian C. Day, executive vice president and chief financial officer. Prior to the appointment, Ching was general manager in North America for the British American Consulting Group. Prior to that he was senior vice president of information systems at Lucky Stores, Inc.

Cambridge Technology Partners in Cambridge, Mass., has announced the appointment of **Diane Smigel** as a senior client partner at the consultancy's Cambridge office. Prior to her appointment, Smigel was vice president for corporate information services at John Hancock Financial Services, where she directed all corporate technology functions, including data centers, voice and data networks, distributed computing, architecture planning and research.

The National Association of State Information Resource Executives has announced the appointments and retirements of several members. **Jake Hoffman** has been appointed statewide information technology coordinator for the state of Idaho. He replaces **Al Arvish**, who recently resigned. **David Litchliter** has been appointed executive director of central data processing for the state of Mississippi. He replaces **John Ruffin**, who recently resigned. **Carol Purcell** has been appointed executive director of the Department of Information Resources for the state of Texas. She replaces **Ann Fuelberg**, who left state government. **Linda Hibbs** has been appointed administrator of the Office of Telecommunications and Information Systems for the state of New Jersey. She replaces **Elaine Davis**, who left New Jersey state government. **Larry Huckabee** has retired as director of the Office of Information Technology Policy and Management Division of Research and Statistical Services for the state of South Carolina. **Charles Livingston** has been appointed director of the Department of Information Technology for the state of Virginia. He replaces **J. Westwood Smithers Jr.**, who left Virginia state government. **Hudnall Croasdale** has been appointed director of the Council on Information Management for the state of Virginia. He replaces **Patricia Jackson**, who left Virginia state government. **Mark Regan** has been appointed acting director of the Office of Information Systems Management for the U.S. Department of Health and Human Services. Regan previously served as director of the Federal Electronic Benefits Transfer Task Force.

Grant Thornton, an accounting and management consulting firm based in Chicago, has announced the appointment of **Bill A. Stephenson** as partner and director of information technology services in the Atlanta office. He will coordinate all information technology services, including the analysis, development and implementation of client/server and midrange information systems. Stephenson was formerly senior vice president and CIO at Dun & Bradstreet Software.

The National Automated Clearing House Association (NACHA) in Herndon, Va., has announced that **Andrew L. Higgins** has been elected chairman of the board of directors. Higgins is a senior vice president and director of business banking support services at Barnett Banks, Inc. in Jacksonville, Fla. He is on the board at Payment Systems Network, Inc. and is a member of the executive committee of NACHA. Higgins has 25 years' experience in banking and bank data processing. He has been responsible for managing various areas within Barnett, including data processing customer service. Prior to joining Barnett, he worked at Electronic Data Systems Corp., where he was responsible for several bank data processing facility management operations.

Open Environment Corp. in Boston has announced the appointment of **Dennis Ross** to its board of directors. Ross is former senior vice president and CIO at **The Home Depot**.

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[illegible]	134.8	183.9	183.9
[illegible]	11.93	15.04	15.04
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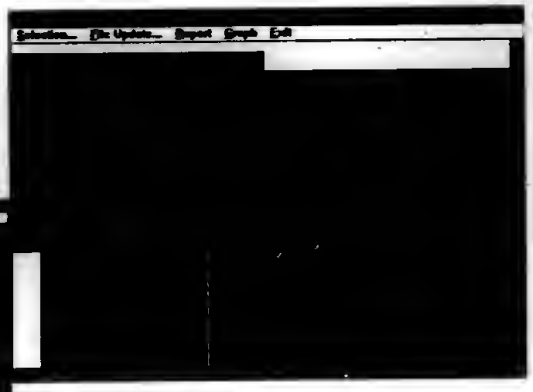

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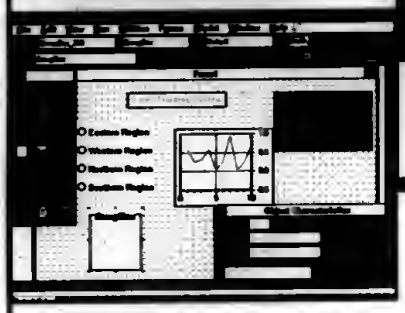

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Calendar

FEB. 5-11

Demo '95. Palm Springs, Calif., Feb. 5-8 — The conference will include product demonstrations, premieres and head-to-head showdowns. Contact: InfoWorld Editorial Events, San Mateo, Calif. (800) 633-4312.

Fourth Annual AS/400 Operations Automation User Conference. Phoenix, Feb. 6-9 — Contact: Help/Systems, Inc., Minnetonka, Minn. (612) 933-0609.

Process for Building an Effective Process Management and Standards Program. Orlando, Fla., Feb. 6-9 — Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

Decorum '95 Conference. La Jolla, Calif., Feb. 7-9 — The conference will feature several speakers and sessions on client/server, mission-critical deployments in the enterprise. Contact: Elaine Wolf, Transarc Corp., Pittsburgh, Pa. (412) 338-4400.

Intermedia '95. San Francisco, Feb. 7-9 — Contact: Intermedia '95; Carrollton, Texas (203) 840-5634.

Ninth Annual Conference on Improving Productivity in System Development. Mesa, Ariz., Feb. 7-10 — Contact: Applied Computer Research, Inc., Phoenix, Ariz. (602) 995-5929.

Coexistence and Evolution of Legacy Information Systems. Tempe, Ariz., Feb. 8-10 — Contact: College of Engineering and Applied Sciences, Center for Professional Development, Tempe, Ariz. (602) 965-1740.

Conceppts '95: The Prepublishing Conference and Exhibition. Orlando, Fla., Feb. 8-11 — The conference will offer digital prepublishing technology users a program of 63 seminars and a variety of special sessions. Contact: Graphic Arts Show Co., Reston, Va. (703) 264-7200.

FEB. 12-18

18th Annual Training '95 Conference. Atlanta, Feb. 13-15 — Keynote speakers include author Tom Peters. Conference topics include making the right technology choices for learning and performance development, networking with peers, discovering suppliers and products that will help your organization and transforming workplace performance. Contact: *Training Magazine*, Minneapolis, Minn. (612) 340-4750.

Networking Solutions Networks Expo'95. Boston, Feb. 14-16 — Contact: Bruno Blenheim, Inc., Fort Lee, N.J. (201) 346-1400.

The Data Warehousing Conference: Your Competitive Business Advantage. Orlando, Fla., Feb. 14-16 — Keynote speakers will include Ken Orr, principal of The Ken Orr Institute; John A. Zachman, president of Zachman International; Christopher Erickson, president and chief executive officer of Red Brick Systems. Fee: $995. Contact: DCI, Andover, Mass. (508) 470-3880.

Client/Server Conference and Exposition: Merging Business with Technology. San Jose, Calif., Feb. 15-16 — Features special appearance by Steve P. Jobs and keynotes by William D. Connor, Alan Kay, Michael Schrange, David Barany and Aaron Zornes. Contact: CMP Publications, New York, N.Y. (516) 733-6770.

FEB. 19-25

Orlando Multimedia '95. Kissimmee, Fla., Feb. 22-24 — Contact: Society for Applied Learning Technology, Warrenton, Va. (703) 347-0055.

Transition to the New Computing Environment. San Diego, Feb. 22-24 — Contact: Ashley Pierce, Gartner Group, Inc., Stamford, Conn. (203) 967-6774.

FEB. 26-MARCH 4

SAC '95: 1995 Symposium on Applied Computing. Nashville, Feb. 26-28 — Contact: Jim Hightower, Association for Computing Machinery, Claremont, Calif. (909) 624-8902.

The PC Nightmare Symposium. Orlando, Fla., Feb. 27-March 1 — Topics include upgrades and alterations, disposition, obsolescence, software, maintaining standardization and assessing cost, including support and management. Contact: International Computer Negotiations, Inc., Winter Park, Fla. (407) 740-0700.

Engineering Document Management Systems Focus '95. Orlando, Fla., Feb. 27-March 2 — Contact: Kalthoff Group, Cincinnati, Ohio (513) 794-3367.

Effective Methods to Manage and Control a Work Process. Orlando, Fla., Feb. 27-March 2 — Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

Bringing the Power of Teamnets to Your Work. Cambridge, Mass., Feb. 28-March 1 — A highly interactive workshop led by Jessica Lipnack and Jeffrey Stamps, authors of *The Age of the Network* and *The TeamNet Factor*. Contact: The Networking Institute, Inc., West Newton, Mass. (617) 965-3340.

MARCH 5-11

Information Security Managers Symposium XIV. San Diego, March 7-9 — Contact: MIS Training Institute, Framingham, Mass. (508) 879-7999.

Lasers *and* ink-jets *and* thermals, OH MY!

Color printers are headed for Emerald City, but there are *potholes* in the yellow brick road

How low can they go?

BY LYNDA RADOSEVICH

Like Dorothy's drab Kansas transformed into bright Oz, black-and-white business reports and overhead slides sparkle with the addition of color. But supporting color printers is a staggering task, according to information systems managers. It doesn't matter what technology is used — ink-jet, laser or thermal — the brilliant output is gained with IS pain.

"All of these [color printers] are very tricky to maintain," says Jim Dugan, information delivery systems manager at Frank Russell Co., a financial services company in Tacoma, Wash.

Color printers are more complicated than their black-and-white brethren because each page is printed four times with four different colors. Thus the possibilities for mistakes that require IS intervention — from roller jams to calibration errors — grow exponentially, Dugan says.

However, falling hardware prices and growing interest among business managers mean IS professionals increasingly find themselves puzzling at the color printer support conundrum (see story page 93).

The challenges facing them include the following:

- **Containing the high cost** of color printer consumable items.
- **Standardizing** inconsistent color output.
- **Rewriting custom applications** that now speak only black and white.
- **Managing** increased network traffic load.
- **Training end users** in unfamiliar color concepts and technologies.

Quite simply, color printer management heightens the IS workload.

"I estimate that we spend 20% more man-hours' worth of maintenance on color printers than standard printers," says Don Wood, a computer information specialist for the state of Washington's Department of Labor and Industry in Olympia.

Printer support in general consumes about 11% of the time IS spends on the department's 3,000-node network per week,

Color printers, *page 93*

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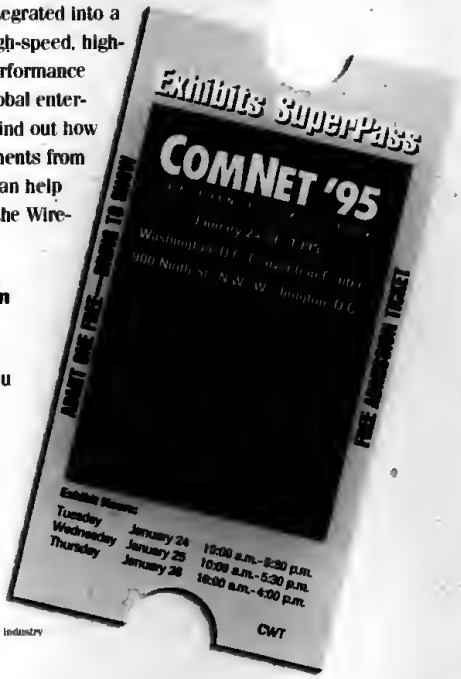

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Color printers

CONTINUED FROM PAGE 91

Wood adds.

One of the biggest problems is that "color printers have roughly a dozen consumable items that need replacing — developers, toners, OPC [organic photo conductor] belts. In contrast, a typical monochrome HP LaserJet has just one cartridge that snaps in," says Paula L. Bursley, an analyst at Dataquest, Inc., a market consulting firm in San Jose, Calif.

Frank Leung, chief financial officer at Charles A. Bell Securities Corp., an investment banker in San Francisco, says color cartridges for his firm's Canon Computer Systems, Inc. CJ10 photocopier/laser printer cost roughly $100 each. The printer requires a separate cartridge for each of its four colors, and one cartridge lasts about 2,000 pages, or one to two months. That's roughly five times the cost of the regular printer cartridges, he says. Another problem is that the colors run out at different rates and is detected only when the color quality degrades, he says.

Leung says he keeps a key to the printer to help control costs. When end users want to print color brochures and proposals, their projects must first pass muster with him.

But for all the trouble, "the cost per page is still cheaper than service bureau printing, which is $2 per copy vs. 50 to 70 cents per page, including the paper," Leung said. He added that cost savings drove his company to purchase the color printer/copier.

Another issue is consistent color output. Frank Russell Co., for instance, has mainframe, client/server and PC applications, and few of the packages match in terms of color rendering, Dugan said.

For example, one application may use a red-green-blue (RGB) color system, but the printer may use a cyan-magenta-yellow-black (CMYK) system. A user can specify an RGB blue for a certain money fund, but if the translation to CMYK doesn't work properly it might look purple in the printout.

"If I get a piece of work from one machine created in one kind of software and want to integrate it with work from other platforms, I don't want one to look blue and one to look purple. It's jarring, and it looks amateurish," Dugan says.

The same calibration troubles occur in matching what the user sees on the computer monitor vs. the printed output. To help address this, Frank Russell Co. uses a $48,000 Xerox Corp. 4700 color laser printer that can handle most color systems and printer languages. Also, the firm is trying to impose Pantone color standards, so applications send the same color commands to the printer, Dugan says.

NETWORK TO ITS KNEES

At the network level, color printing poses just as many challenges. Because of their size, color files put larger loads on a network than monochrome files. For example, adding a simple 24-bit image to a 400K-byte text file can bloat it to 40M bytes, according to Bill Flynn, an analyst at BIS Strategic Decisions in Norwell, Mass.

"Full-color images don't compress well. So if you're not careful, you can send some choking file that will bring a simple network to its knees on the spot," Flynn says.

For now, the only remedy is to make sure the network servers and wiring are robust enough for color traffic flow and the drivers are the latest technology, Flynn says.

Several users say lower-end ink-jet printers don't perform well on networks. Overuse and underuse can cause problems such as color degradation and clogged ink-jets, respectively.

As the color printer market grows, end-user training might solve some of the support problems. Never mind the software; just the basics of color usage are very complex. And most mistakes end with a call to the help desk, users say.

But despite the shortcomings, IS can plan to support color printers for a long time. "You have no idea how much of a fight I had getting the first one in here. You can't get them out now. And I expect more to be used next year," Dugan says. ■

Radosevich is a freelance writer in Belmont, Mass.

The **black and white** of *color* printing

Ink-jet, solid ink-jet, color laser, thermal wax transfer and dye sublimation seem like a quagmire of terms. But really, color printers fall into three categories: Ink-jet and solid ink-jet; lasers; and thermals, which include wax transfer and dye sublimation. Here are more details to help you understand the printer types and their features:

PRINTER: ink-jet
LEADERS: Hewlett-Packard Co., Canon Computer Systems, Inc.
PRICE: $400 to $2,000
ESTIMATED UNITS SHIPPED LAST YEAR: 2½ million
UNITS PROJECTED TO SHIP THIS YEAR: 3 million
PROS: Cheap, and one of the only options for plain-paper text printing with color.
CONS: Color print quality is not the highest. Monochrome text quality is not as good as laser, tends to be slow and, for overhead transparencies, output needs to dry.
DEFINITION: Ink-jet printers use liquid ink that is deposited on the paper through a printhead that has hundreds of tiny nozzles. The printhead passes across the paper one or more times to deposit up to four different color inks.

PRINTER: Color solid ink-jet
LEADERS: Tektronix, Inc., Brother International Corp.
PRICE: $10,000
ESTIMATED UNITS SHIPPED LAST YEAR: See ink-jet above.
UNITS PROJECTED TO SHIP THIS YEAR: See ink-jet above.
PROS: Good for generating page compositions and graphics proofs.
CONS: Print is shiny, bumpy-feeling and not as durable as laser output. Printers take 25 minutes to warm up. Quality of overhead transparencies is not good.
DEFINITION: Color solid ink-jet printers are also known as phase change ink-jet printers. This technology uses an ink that is solid at room temperature. The ink is heated to a liquid state and deposited on the paper similar to the method used in standard ink-jet printing. Solid ink-jet devices can print on a larger variety of surfaces than standard ink-jet devices such as porous and rough surfaces.

PRINTER: Color laser
LEADERS: QMS, Inc., Hewlett-Packard
PRICE: $7,200 to $11,000 (more when combined with color copiers)
ESTIMATED UNITS SHIPPED LAST YEAR: 6,000
UNITS PROJECTED TO SHIP THIS YEAR: 30,000
PROS: Excellent monochrome text with good quality color integrated.
CONS: Consumable items need to be replaced, and colors can be inconsistent.
DEFINITION: Color laser technology uses the same process as office copiers and monochrome laser printers. A static charge is applied to a photoreceptive drum or belt. A laser beam exposes the areas not to be printed, leaving charged the areas that will be printed. A dry toner is applied that adheres to the charge areas, and the image is transferred electrostatically to the paper. The drum or belt is rotated up to four times — once for each toner color — cyan, magenta, yellow and black. Finally, the image is fused with heat, pressure or both.

PRINTER: Thermal wax transfer
LEADERS: Tektronix, Fargo Electronics, Inc. and Seiko Instruments USA, Inc.
PRICE: $1,000 to $2,000 for low-end printers, $3,000 to $9,000 for higher-end printers.
ESTIMATED UNITS SHIPPED LAST YEAR: 45,000
UNITS PROJECTED TO SHIP THIS YEAR: 40,000
PROS: Good for overhead transparencies and cheaper than dye sublimation.
CONS: Slow, and many brands don't print well on plain paper. If using only small amount of color, cost is same as 100% coverage. Output can scratch off.
DEFINITION: This process consists of heating colored wax on a thermal transfer ribbon and fusing the wax to paper. There are usually three or four passes per sheet to be printed — once for each toner color — cyan, magenta, yellow and black. Black is not always used because the mixture of the other three colors can simulate black.

PRINTER: Thermal dye sublimation
LEADERS: Tektronix, Eastman Kodak Co.
PRICE: $7,000 to $20,000 at high end
ESTIMATED UNITS SHIPPED LAST YEAR: 8,000
UNITS PROJECTED TO SHIP THIS YEAR: 10,000
PROS: Photo-realistic output, suited for electronic photography and medical imaging.
CONS: Can't print on plain paper, and cost of consumables is high. Traditionally not good at printing text.
DEFINITION: Also called dye sublimation or thermal dye transfer. The technology uses an ink roll similar to wax thermal transfer printers. In dye diffusion, the dyes are vaporized by heat (as much as 400 degrees Fahrenheit) from the printhead and diffused across a very small gap to the receiving sheet. Sublimation implies passing from a solid to a gaseous state without an intervening liquid phase. This process requires special paper that resembles photographic stock.

Sources: Dataquest, Inc. in San Jose, Calif., BIS Strategic Decisions in Norwell, Mass., and MWA Consulting in Palo Alto, Calif.

Computerworld Firing Line:

Low-cost lasers **save** on consumable items

BY KEVIN BURDEN

The QMS, Inc. Magicolor and Xerox Corp. 4900 color laser printers are perfect examples of how vendors can start with the same core technology yet build separate products that operate very differently.

Both printers, which are built around the same Hitachi Data Systems Corp. engine, come with Printer Control Language 5, PostScript Level 2 compatibility and share the same 21½ by 23½ by 14½ in. chassis. But dissimilar speeds and resolution give these printers individual personalities.

"By adding different intelligence in the form of software and controllers, vendors can make what is essentially identical printing engines appear very different," says Julianne Mehegan, a senior industry analyst at BIS Strategic Decisions in Norwell, Mass.

Magicolor uses a 33-MHz RISC processor, and the 4900 uses a 25-MHz RISC processor. But curiously, Magicolor's engine operates slower than the 4900's, which means the print speed is also slower than the Xerox contender. Magicolor can print eight black-and-white pages per minute and two pages per minute in full color. The 4900 can push out 12 black-and-white pages per minute and three color.

QMS announced last week a new member of its color laser family, called Magicolor Plus, with 3 to 12 page/min engine speed (see "QMS responds," next page, for upgrade options).

Magicolor is again outclassed by the 4900's resolution, which is capable of 300 by 1,200 dot/in. in color compared with Magicolor's 600 by 600 dot/in.

But long-run costs are where Magicolor might have an edge. Its color cartridges are nearly 40% cheaper than those used by the 4900, making it a more affordable printer down the road.

The three Xerox evaluators included an advertising agency, a telecommunications carrier and a financial services firm. QMS evaluators included an automaker, an insurance firm and a graphics design studio. The format for this evaluation was prepared with assistance from Howard Rubin Associates and Technology Investment Strategies Corp.

OUTPUT QUALITY

The most noticeable difference between the two printers is resolution. The 4900 can print at 300 by 300, 600 by 600 or 300 by 1,200 dot/in., while Magicolor offers 300 by 300 and 600 by 600 dot/in. Neither, however, can print in their high-resolution modes with the standard 12M bytes of RAM. Both require an additional $1,000 16M-byte upgrade.

The 4900's higher resolution gives it an obvious edge over Magicolor, but no users of either printer said they were dissatisfied with its overall output quality.

Evaluators of both printers complained about noticeable dithering patterns when printing large graphics, yet they marveled at the quality of color text printing.

Advertising agency (Xerox): "The shading gradations bled together wonderfully, but there was an obvious dithering pattern you could not help but notice."

Financial services firm (Xerox): "Color text printing was a surprise. We were not expecting color text to be so sharp."

Automaker (QMS): "Dithering is the main area we hope the Magicolor will improve in. Its quality is not what we hoped we would get."

Graphics design studio (QMS): "The color text has a clarity that almost equals its black text."

COST OF OWNERSHIP

Cost further differentiates the two printers. At $9,999, Magicolor is initially more expensive than the $8,495 4900, but long-run costs are dictated by toner price. Both printers use separate cartridges for the four colors, but Magicolor's cartridges cost approximately $125 each compared to $200 for the 4900 cartridges.

Automaker (QMS): "Each cartridge prints 80,000 pages, so we don't expect to replace them too often, but the price is not making us worry about it either."

Advertising agency (Xerox): "We have already had to replace a couple of colors. If we have to do this often, we'll end up with quite a bill."

Unlike other color technologies that typically require special paper, color laser printers accept plain paper, which was a major consideration for all users in this evaluation.

Telecommunications carrier (Xerox): "We had a [Canon Computer Systems, Inc.] color Bubble-Jet 10, which cost about $3,000 more than the 4900. And mostly because of the special paper, we had a very high consumable cost. With the 4900, we no longer have that high paper cost."

Automaker (QMS): "We used to have to buy special paper for our color ink-jets, which was charged to our department. Now we just use regular paper supplied by our company for our copier machines."

EASE OF INSTALLATION

Not a single user experienced any problems while installing the printers.

Financial services firm (Xerox): "Drivers were loaded with a typical Windows install, and the tutorial clearly showed how everything needed to be done."

Automaker (QMS): "It was as intuitive as you can get. As far as installing the cartridges, we let the users do it for themselves."

For network installations, both Magicolor and the 4900 are equipped with LocalTalk and have several interface cards available separately for Ethernet and Novell, Inc. NetWare networks. Again, users said there were no surprises during the hookup.

Automaker (QMS): "We had to install more memory into the printer so it could handle the additional jobs we queued to it, but the actual network hookup was no different than any other network printer hookup we've performed."

After the installation, two evaluators using Xerox 4900s reported a problem with the printers not accepting more than a certain number of jobs in the print queue. The problem was a loose chip in both cases.

Telecommunications carrier (Xerox): "I could still print but could not queue too much at one time. It ended up being a chip cocked sideways."

Advertising agency (Xerox): "The printer would say it was processing, but nothing would ever come out. Xerox said the loose chip was probably jarred during shipping."

EASE OF SERVICE

The color cartridges for both printers are located on top and snap in and out with ease. So far this has been the extent of in-house service performed by all evaluators. But because only the 4900 comes with an on-line guide that helps users troubleshoot problems, Xerox users may be better prepared to handle mishaps than QMS users.

Financial services firm (Xerox): "The on-line

FIRING LINE

So close and yet so far...

Both color laser printers started off with the same print engine, but the additional intelligence Xerox added to its printer produces superior output quality

Ratings are based on a 1-to-10 scale, where 10 represents extremely satisfied and 1 is not at all satisfied. Ratings are the average of the users' satisfaction ratings weighted by the categories' importance. Total score is the average of all ratings

XEROX 4900 Xerox Corp. Rochester, N.Y. (800) 275-6376	CATEGORY Listed in order of importance	MAGICOLOR QMS, Inc. Mobile, Ala. (800) 523-2698
6.9	TOTAL SCORE	6.6
7.3	OUTPUT QUALITY	6.8
6.4	COST OF OWNERSHIP	6.4
6.5	EASE OF INSTALLATION	6.5
6.3	EASE OF SERVICE	6.3
8.1	VENDOR SUPPORT	6.9

guide explains exactly what you need to do depending on the error message. It also has a tutorial teaching you how to optimize its color."

VENDOR SUPPORT

Evaluators said QMS' support is very knowledgeable but the company's responsiveness was inconsistent.

Graphics design studio (QMS): "I'm not sure if they get busy at certain times, but their responsiveness, which is typically top-notch, drops off periodically."

Xerox users interviewed did not have to rely on Xerox's technical support team, with one exception.

Financial services firm (Xerox): "Most of our problems happened because we did not specify everything we needed in our original request. But because the 4900 is a new product, Xerox appeared to give us additional attention." ■

Burden is *Computerworld*'s senior researcher, Firing Line/Scorecard.

QMS RESPONDS:

MAGICOLOR PLUS UPGRADE

QMS offers a Magicolor Plus upgrade option for $199 to current Magicolor users. The upgrade will provide the Magicolor Plus software enhancements, which include QColor, a new technology that provides color matching support, improved color screening, color rendering, automatic color optimization, color customization and the drivers necessary for most Macintosh and Windows applications. It does not provide the hardware upgrade for increased engine speed and envelope support

RESOLUTION

QMS does not plan to increase the resolution higher than the corrent 600 by 600 dot/in.

XEROX RESPONDS:

COLOR CARTRIDGE COSTS

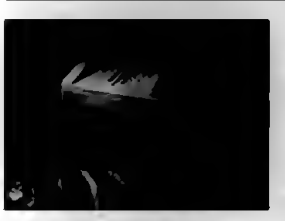
The fully saturated colors of the 4900 justify the slightly higher cost per page when compared with the laser printer, which has a lower toner cost. Xerox offers volume discounts for customers who use large amounts of toner.

MEMORY CHIP

The loose chip problems experienced by two evaluators were the result of improperly installed memory upgrades by several dealers shortly after the launch of the 4900. This was easily corrected by the dealers. Bulletins have since been issued to dealers regarding this problem.

Product Roundup:
Laser printers

The following are the latest color lasers from the market leaders and what the PC reviewers said about them. Prices are list prices.

PRINTERS	PROS	CONS
MAGICOLOR **QMS, Inc.** Mobile, Ala. (800) 523-2696 **PRICE:** 12M-byte: **$7,999** 28M-byte: **$8,999**	True 600 dot/in. print resolution; network connectivity; good quality for text and graphics in both monochrome and color; good color adjustment features in driver. – PC Week, July 18, 1994 Can use plain paper for color printing. Has better intensity and saturation of color. – MacUser, November 1994 Offers superb speed and higher print resolution than Color LaserJet. – MacWeek, Sept. 19, 1994 Hardware setup a breeze. Has true 600 dot/in. resolution. – PC Computing, November 1994	Higher price tag than Xerox's 4900; complex serviceability; difficult hardware upgrades. – PC Week, July 18, 1994 Difficult to set up and use. Inadequate manual. Has only 250-page capacity and color inconsistencies. – MacUser, November 1994 Low duty cycle and higher price limits appeal as general business machine. – MacWeek, Sept. 19, 1994 Most costly printer in the bunch. – PC Computing, November 1994
 **4900 COLOR LASER PRINTER** **Xerox Corp.** Rochester, N.Y. (800) 275-9376 **PRICE: $8,495**	In 1,200 by 300 dot/in. color print tests, the 4900 fared very well with bright, saturated color and no noticeable dithering. – PC Magazine, Nov. 22, 1994 Enhanced 300 dot/in. resolution that stacks up well against true 600 dot/in.; excellent network connectivity support for Novell; better print quality in photographs than QMS; low entry price. – PC Week, July 18, 1994 Plain-paper color printing, excellent manual and tutorial, good color-blending storage. – MacUser, November 1994 Good choice for general-business users looking for high resolution and high duty cycle. – MacWeek, Sept. 19, 1994	On 300 dot/in. color tests . . . dithering was noticeable and the registration was a little bit off in printing process. – PC Magazine, Nov. 22, 1994 Complex serviceability; difficult hardware upgrades; color-calibration software and driver options do not stack up. – PC Week, July 18, 1994 Only 250-page paper tray capacity; no hard drive; color inconsistencies. – MacUser, November 1994
COLOR LASERJET **Hewlett-Packard Co.** Palo Alto, Calif. (800) 527-3753 **PRICE: $7,295**	The lowest-priced color laser printer available. Delivers more than twice the speed of an ink-jet printer at a comparable cost per page. – Windows Sources, November 1994	Has only 300 dot/in. resolution. – Windows Sources, November 1994 Shows far more obvious dithering patterns than QMS or Xerox. – PC Magazine, Nov. 22, 1994

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Buyers' Satisfaction Scorecard:

Low-end color ink-jets are **priced to sell,** with quality to please

BY KEVIN BURDEN

The speed of color ink-jet printers may not match that of color laser printers, but their performance is still more comparable than their prices.

Ink-jet printers, which use liquid ink to print a line at a time, are slightly slower than lasers, which transfer images with dry ink directly from memory to paper. But because ink-jets start at less than $500 and produce a highly rated output quality, they are a sound alternative to $10,000 color lasers.

In this evaluation, 50 customers of each of the three market-leading printer companies rated their satisfaction with the performance and service of their color ink-jets.

The majority of Hewlett-Packard Co. users surveyed used the DeskJet 560C. Canon Computer Systems, Inc. users used the Bubble-Jet 600, and Lexmark International, Inc. customers used the 4079.

The 4079, which has a $2,000 price tag, does not compete directly with the DeskJet 560C or the Bubble-Jet 600, both of which retail for $499. But at the time of our survey, the 4079 was the only Lexmark printer with a large enough installed base to qualify.

Lexmark announced the ExecJet IIC, a more affordable and comparable low-end printer, last August, but too few corporate installations were found for the survey. The ExecJet IIC retails at $350 and prints color at 300 by 300 dot/in. and black at 300 by 600 dot/in.

What the 4079 delivers for the extra money is speed and additional features, such as PostScript and tabloid-size printing. But users should not expect the output quality to be four times better than the HP or Canon printer. "In fact, if you're not looking for tabloid-size output, it would be hard to make a case for the 4079," says industry analyst Bill Flynn of BIS Strategic Decisions in Norwell, Mass.

Market-leading ink-jet printers

BUYERS' SATISFACTION SCORECARD

Ratings are based on a 1-to-10 scale, where 10 is best. Total score is the average of ratings weighted by the category's importance to that vendor's users. Categories are listed in order of importance to all users. Response base: 50 users per product.

	CANON Bubble-Jet 600	HEWLETT-PACKARD DeskJet 560C	LEXMARK DeskJet 4079*
Overall score	6.2	6.1	6.1
Output quality: Resolution, overall quality	7.5	7.1	7.3
Printer quality: Character, uniformity	6.3	6.4	6.4
Technical support: Ease of service, responsiveness, support contract, warranty	5.7	5.7	6.3
Performance: RAM required, reliability, speed	5.6	6.1	5.9
Cost: Price, cost of consumable items	6.2	5.8	5.2
Color capabilities: Number of colors, quality, manual adjustments	5.8	5.5	5.3

*Lexmark's 4079 is an older, more expensive color ink-jet printer but offers PostScript and tabloid-size printing not available on HP and Canon models

OUTPUT QUALITY

As the ratings indicate, users of the Bubble-Jet 600 were just as satisfied with output quality as were the 4079 users. This was because the printheads in both models are the same. Lexmark uses Canon's 360 dot/in. printhead, which Canon also uses in its Bubble-Jet 600.

The DeskJet 560C, which prints color at 300 dot/in., received satisfaction scores comparable to the higher-resolution Canon and Lexmark printers.

"Output quality can be very subjective to the user. Canon has traditionally had very good quality, and HP has really improved its quality through improvements to its ink cartridge and printheads," says Paula Bursley, an analyst at Dataquest, Inc. in San Jose, Calif.

Beyond resolution, the ink-cartridge approach of the DeskJet 560C also differs from the Bubble-Jet 600 and the 4079. Both Canon and Lexmark use a four-cartridge system while the 560C uses only two — one black and one tricolor.

The drawback to using two cartridges is that black is often produced in a muddy tone in full-color graphics. This is because the tricolor cartridge, not the black cartridge, typically creates the black. HP offers four-cartridge printers, but users will have to step up to at least the $1,249 DeskJet 1200C.

PRINT QUALITY

It is the color capabilities that lure most customers to these printers, but most of those users continue to print volumes of black-text documents. Black is where the DeskJet 560C most notably outperforms the others. HP boosted its monochrome resolution to 300 by 600 dot/in. Both the Bubble-Jet 600 and the 4079 print black text at only 360 dot/in., the same resolution they print color.

But satisfaction ratings for HP's print quality equaled Lexmark's rating and were only slightly better than Canon's. "Print quality is really analogous to a bottle of wine. What is considered good is really up to the user," Flynn says.

PERFORMANCE

Speed does kill. Users give a lot of weight to a printer's speed, with an overall importance score of 7.2, but all three printers received their lowest satisfaction score in this category — and that is beginning to impact buying decisions.

Those who indicated they would be unlikely to buy the printers again placed more importance (8.3) on speed and had a lower satisfaction rating in this category.

HP, which made efforts to improve the 560C's performance with its ColorSmart driver, received the

Low-end color ink-jets, *page 98*

Somewhere over the rainbow...

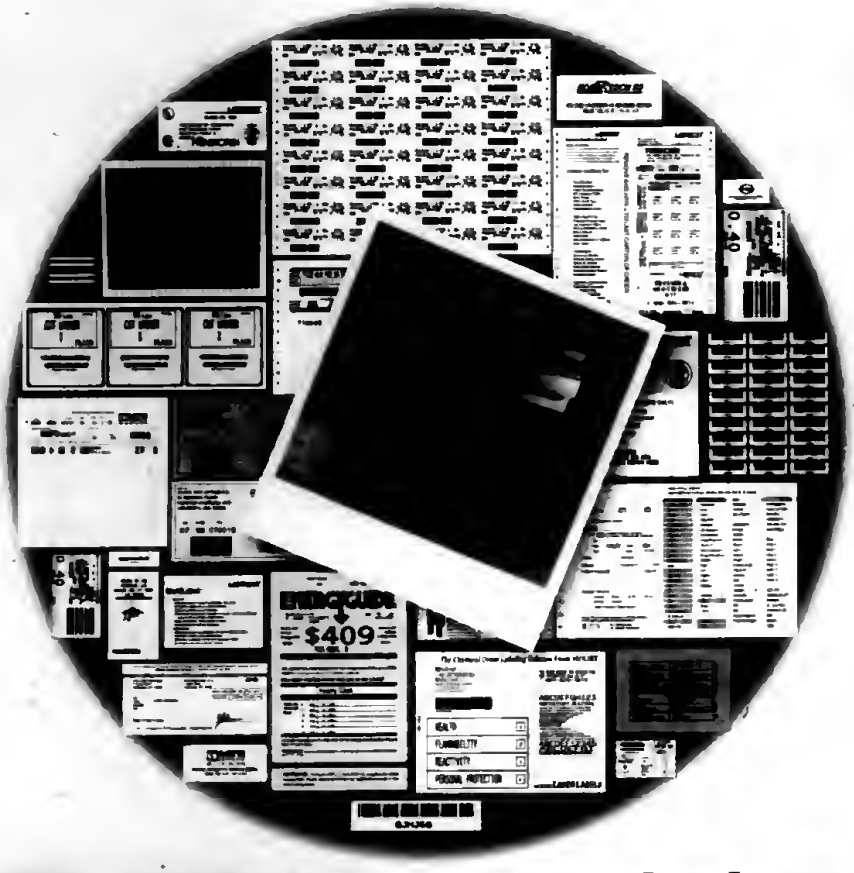
Color printer vendors of all stripes are taking information systems support issues seriously and offering solutions.

On the hardware side, Hewlett-Packard Co.'s Printer Control Language (PCL) is emerging as a standard. Developers can write standard escape codes into their software, for example.

On the software side, Microsoft Corp. is building color management capabilities into its next generation of Windows, the Windows 95 32-bit operating system, using Eastman Kodak Co. technology. Apple Computer, Inc. also uses the Kodak technology, which controls color translation from one device to another.

However, applications that were written before the standards still contain specific printer control codes. To take advantage of the new standards, users will have to rewrite their applications.

"Our direction is toward the PCL standard, but the problem is when you change technologies, the application doesn't work anymore without rewriting," says Don Wood, a computer information specialist for the state of Washington's Department of Labor and Industry. —*Lynda Radosevich*



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Low-end color ink-jets

CONTINUED FROM PAGE 97

highest rating in this category. The driver analyzes and identifies all the elements of each page and then automatically sets its own optimizing controls. Canon lacks quality-boosting features in its Windows driver and can take twice as long as HP's ColorSmart to send a file to the print manager.

"Canon's first driver was an abomination," Flynn says. "They have since resolved its problems, but you had to have sent in your registration card to be notified of the update." But even with the update, the Bubble-Jet 600 is still not as fast as the DeskJet 560C, Flynn explains.

COST

Aside from the expensive 4079, the DeskJet 560C and Bubble-Jet 600 are priced to attract customers who might need to print only black-text documents but want the security of having color just in case. But operational costs beyond the purchase price might stun users accustomed to just monochrome printing. Special paper that stands up to oversaturation and multiple color cartridge replacements will be an ongoing expense that could require a separate budget.

After Lexmark, which scored the lowest in customer satisfaction for its initial purchase cost, was HP, which scored the lowest for its cost of consumable items.

Because the tricolor cartridge in the DeskJet 560C creates all colors, it must be replaced more frequently than the separate color cartridges in the Bubble-Jet 600 and the 4079. HP has also integrated the ink cartridge and print head in one unit, which makes them more costly. The upside is that head wear is not a factor because the heads are discarded and replaced with each cartridge.

Canon users were most satisfied with price because cartridges cost only $8 each.

TECHNICAL SUPPORT

The high support rating went to Lexmark, "which is impressive for a company that is considerably smaller than both HP and Canon," Burlsey says. But its modest user base may be a factor in its service success. "HP and Canon have been selling printers by the pallet load and could be overwhelmed with support calls," Flynn says. ■

Managing Software Maniacs

BY KEN WHITAKER

Development managers are confronted with talented but problematic developers and consultants every day. The secret to making good management decisions is doing what is right for your users.

I am writing directly to anyone who has experienced the pain of delivering software applications.

In my more than 20 years of developing software and managing developers, I've formed some opinions on what makes a software development leader. Reading books on leadership fundamentals is certainly a start, but actions — consistent actions — are the only way for your staffers to measure your leadership abilities effectively. We're all tempted, when under pressure, to equate leadership with autocratic rule. Will your developers stand for that? I doubt it. Nor will they respect it.

MATT WALTON

I haven't found a software organization that is not constantly under scrutiny for "prima donna-ism," "out of control-ism" or "out of reality-ism." These perceptions are sometimes viewed in good humor — until software isn't delivered on schedule.

I've had my share of prima donnas and out-of-control situations that threatened development projects. In dealing with these headaches, I've always focused on what was right for my users (customers).

We've all dealt with engineers and developers who don't feel obligated to work on tasks necessary to grow the business. If they can't agree on the principle of customers first, company second and employees third, then they are likely to be detrimental to you and your staff.

It ain't my job

In one of our department's more eventful meetings, I presented a software engineering task that had to be done. Although it was not an exciting task, it had become the highest priority need for the customer. To me and my managers, this appeared to be an easy decision: Our most senior engineer needed to dedicate a couple of months to the task.

As we discussed the task at the meeting, this particular senior engineer realized the danger of natural selection and, to front of everyone in the department, said, "There is no way I'm going to work on this project even if I'm asked. It's grunt work."

Grunt work — I hadn't heard that expression in a while.

Imagine my surprise. I assured the engineer and everyone else in the room that although a decision hadn't been made yet on who would solve the problem, all of as at times need to help the company when asked. I reminded them that "hell, about 90% of my job is grunt work."

That bold statement was certainly "inspirational."

After the meeting, I confronted the engineer (I mean, the prima donna). And following some moments of heavy dialogue, it was clear that he was convinced this project wasn't his job and that he "could get a job anywhere doing more interesting work."

Well, I took him up on that and escorted him out of the company that afternoon.

Pretty vicious, right?

Maybe, but development groups tend to get to a point at which they become full of themselves.

My main concern was the reaction of the rest of the team. How would they take this employee's forced exit, especially because he was so talented and well liked?

To my surprise, most of the department was not only supportive of my action but saw it as a positive reinforcement of the "customer-first-and-business-second" principle. They had been frustrated, taking lengthy assignments they didn't particularly enjoy, while this individual ap-

Maniacs, *page 100*

Whitaker is a vice president of development and operations at U.S. Data Corp. in Richardson, Texas, and has managed development teams at Data General Corp. and A. C. Nielsen. He is the author of *Managing Software Maniacs* (John Wiley & Sons, Inc.).

Managing Software Maniacs

CONTINUED FROM PAGE 99

peared to do only those short-term tasks that interested him.

It is very easy to become dependent on consultants to help with process, people and communications issues. I can't emphasize enough that development managers should try to handle these issues without consultants or use them only for targeted, well-focused needs.

We can't figure it out, but I **bet** a consultant can

I arrived at one company where management had no strategy, the employees were disenchanted and consultants were onboard and ready to help the company get its act together.

After careful investigation, however, I noticed that some fundamental issues hadn't been addressed. The consultants were highly experienced and very talented, but much of what I witnessed bothered me:

- The consultants had painted a picture of a long-term strategy so glowing that everyone was seeing a bright future without much regard to the current fiscal situation. It was great to know that our untapped market potential was 200 times our current annual revenue, but current revenue wasn't even close to budgeted revenue.
- Development was entirely too dependent on the consultants. Prior management was so out of touch with the troops that these consultants acted as go-betweens and, in my opinion, were actually running the company. To make matters worse, employees felt more comfortable dealing with the consultant organization than with their own management.
- Consultants were facilitating every issue. Team effort was definitely being practiced, which was great, but consensus meetings and feel-good sessions were not resulting in clear decisions.

After about three weeks of evaluating the benefits, I felt the consultants were not helping us achieve the original goals. So I fired them.

What a difficult situation that was. Everyone who had come to depend on the consultants felt abandoned. The developers were now expected to work things out among themselves. Well, I expended tremendous energy ensuring that every team was properly facilitated — but by ourselves, not by external folks. I became personally involved with almost every confrontation, meeting and decision to demonstrate my willingness to work through issues with developers.

This is why the customer, company and employee priorities are so crucial in getting past personal egos and development team wars. Keeping consistent decision criteria helped us through a tough time. Believe me, the folks were very suspicious of me. Not only was I new to the company, but I didn't hesitate to fire the consultants who were hired to straighten out the company.

In the 1990s and beyond, I anticipate that leadership must be demonstrated from within because I'm convinced that every company has tremendous internal talent. Just knowing how to bring out the best ideas and combine them into a coherent strategy is a major responsibility for software management.

You can't have sales-like motivational sessions with cynical, off-beat developers. It is extremely difficult to be in sync with what motivates them as well as maintain leadership respect during stressful times.

Recognize yourself as a **leader**

One of my managers was frustrated with the company and my leadership. At a dinner meeting, he said, "You know, Ken, no one really knows what you or development stands for. You demonstrate no leadership."

I didn't know how to respond. How dare he?

One of my other managers was at the table and she suggested, after the manager left, that we "ought to fire his ass." His comment really hurt. However, if I was in a developer's shoes and didn't see leadership being practiced, I would probably agree with the frustrated manager.

Obviously, being a development leader requires a thick skin and the ability to take constructive criticism from anyone. From that day on, I always pretended that development needed to be reassured constantly of a manager's leadership. Even if you earn the mantle of leader, you're not set for life. It constantly needs to be earned.

For example, I make sure I do the following:

- Continue to make well-informed decisions and get proper buy-in from the management team.
- Communicate good and bad news.
- Stay in touch with the top two or three risks of every project.
- Consistently make decisions based on customer needs first and company business next.

Development teams can become second families, and very difficult management and team problems occur when developers do not perform. Giving developers regular performance feedback will help identify issues quickly. Not handling performance problems properly can destroy teams or, worse yet, cause projects to miss schedules.

Remove people who are not effective

One of my senior managers invented a key technology that brought the company much fame and success. Without his innovation, there would probably not have been a company when I joined.

He had been promoted to a senior management position in development and was responsible for leading his teams to the next plateau of products. He had plenty of ideas and was still considered a visionary.

The problem was that his teams were not getting anything done. Every time he had an idea, he would brainstorm it with his team.

Because of his stature, I felt it would be a problem to take him away from his current responsibility. He had earned it, and if he was demoted, he might quit. My boss was not happy with the team's progress, but I didn't have the heart — or guts — to remove the manager.

My boss intervened and moved the development manager off the project and into a "visionary" (i.e., staff thinker) role. The team was actually happy and wished it had occurred sooner. The manager was not thrilled, but eventually he was relieved. He hadn't been enjoying his role because of the stress.

The moral of the story: Do the right thing for the project and for the company even if it is a difficult personal decision. Your success depends on your staffers being effective at the right job.

Do you think that "empowering" a team will automatically result in focused, accountable actions? Management decisions and management attention is 100% necessary to guarantee that the right decisions are made.

We don't need no **stinkin'** management

I was delivering a poor performance review when, to my surprise, the employee said, "My performance would have been a lot better if our team members managed themselves. In fact, new management books indicate that modern development requires self-managed teams."

There was silence for about 10 seconds.

I responded by saying, "First, I appreciate the fact that you are reading management books and periodicals. I'm sure that there are software organizations that practice self-management. One of the reasons we are having this discussion is that your manager recognized that your performance is impacting your team's performance. The team is empowered to deliver on project component goals. However, I empower the development manager to be responsible for the overall team performance. As long as I'm in charge, I will never expect a team to self-rule because I believe someone needs to take overall responsibility and accountability for the team."

Need I say more? ■

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Computer Careers

Alternative Growth

Shrinking budgets have forced companies into more creative education methods, such as consortium-based training

By Alan J. Ryan

Tightened purse strings translate into cutbacks, especially on the training front. No matter. The need to keep workers well-schooled is spurring more creative use of available funds and, in many cases, increasing training effectiveness.

"The No. 1 challenge to [trainers] is getting management buy-in — justifying the cost of training and beginning to measure a return on investment," says Pat Roberts, co-president of the Information Technology Training Association (ITTA) in Austin, Texas.

In fact, exorbitant costs brought about a consortium in Omaha, where 60 local companies banded together to assess and share the cost of information systems training. Now when member companies want their staffs to learn a technology — for example, object-oriented programming — they hire a trainer and hold an on-site class.

It's a relationship that offers "substantial" savings, says Pat Dunne, senior training specialist at First National Bank of Omaha, a consortium member. Member companies' split the cost of the trainer's travel and lodging and pay for individual participants. Moreover, other travel, lodging or meal expenses don't exist, and participants spend less time away from the office, Dunne says.

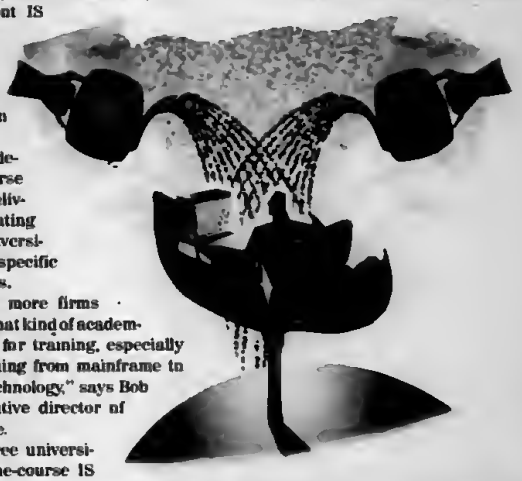
SELECTIVE NURTURING

Technology pioneering companies are more apt to have a formal commitment to training, according to a recent survey by Gartner Group and Open Users Recommended Solutions. In fact, only a select few of the 151 respondents said that skills acquisition is built into the employee review process and monitored by management.

Academic alignment

If you're not in an area that's conducive to consortia, your company may benefit from working with local universities to develop a tailor-made IS training program.

Omaha is home to this type of project as well. The Applied Information Management (AIM) Institute, for example, promotes training through cooperation. Formed by local companies and the academic community, the AIM Institute polls area firms about IS training needs and works with the business community to design complementary courses. It then develops a course wish list and delivers it to participating colleges and universities to create specific degree programs.



"We will see more firms wanting to use that kind of academic environment for training, especially when transitioning from mainframe to client/server technology," says Bob Sweeney, executive director of the AIM Institute.

Presently, three universities offer a nine-course IS program sanctioned by the AIM Institute, Sweeney says. In fact, all 200 available seats are full for the 27 academic hours.

In addition, AIM is working with several companies that are sending employees to local schools for training in computer-aided software engineering methodologies. "These firms are willing to leverage their buying power with the vendors to encourage the vendors to bring that software to the classroom," he says.

When business requirements call for complex training, some companies adopt a mentoring program, says Ellen

Alternative growth, *page 103*

Computer Professionals

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CONTINUED FROM PAGE 101

Hersch, senior analyst in information technology training and education services research at international Data Corp. in Framingham, Mass. While it's not exactly a new concept, companies are using mentors "to train a few key people who will then train other people in their organizations."

Mentors keep work on track and deal with pitfalls and problems, says Ted Cannie, regional manager at Semaphore, a consulting and technical training company in North Andover, Mass.

Mentoring also enables new technologies to branch quickly into a company. Once employees learn something new, they can be "seeded" throughout the organization to work on separate projects and train other employees, Cannie says.

But what if the IS staff doesn't have time to be trained? Trish Koons, training coordinator at Towers Perrin, encountered that problem — many workers at the Philadelphia employee benefits and human resources consultancy wouldn't attend sessions lasting several hours.

As a result, the company condensed its training. "The course is really driven according to what they are going to need to get the job done," Koons says. Training in the basics alone is not always ideal, but it keeps class time short and workers happy, Koons adds.

"All exercises are prepared so that everything is crammed full of activities," and courses are separated by knowledge level, Koons says. Windows users are separated from non-Windows users, most hands-on sessions last no more than three hours, and class size is generally no larger than 15 people.

"We cram an awful lot into a short period of time," Koons says. Users leave with quick-reference cards and "getting started" information so they don't have to wade through reams of technical documentation.

Users of the company's Notes network also receive periodic tips, updates and other helpful information in their mailboxes. And for those who want more information, Towers Perrin offers optional lunchtime courses on advanced features.

Surprisingly, in light of the tight resources, soft skills are not being neglected, says Kathleen Warren, senior research analyst at Gartner Group, Inc. in Stamford, Conn. Training includes project management, team building, quality management, listening skills, leadership and tolerance of diversity. "Those issues are becoming as important as the more traditional technical skills," she says.

CONSIDER THIS

It takes an untrained practitioner, user or developer three to six times as long to accomplish the amount of work done by the trained worker. That means that 12 hours of formal training can equate to as much as 72 hours of self-training.

Source: Gartner Group, Inc., Stamford, Conn.

But whether you're struggling to keep training costs in check or simply looking for the latest methods, you've got to keep training methods in perspective.

"This is skill development. People have to spend time thinking it through and understanding concepts," says Richard Scoville, a software training consultant in Chapel Hill, N.C. "There are no instant fixes in this business."

No easy answer

Consortium-sponsored training programs, though cost-effective, are not a cure-all. They cover only a fraction of the training needs of a 200-plus IS operation such as that of First National Bank of Omaha, Dunne says. When the consortium's training interests don't warrant a local class, but the bank's IS workers require the knowledge, they're sent out for training. "That's still the majority of the solutions," Dunne says.

Every situation must be taken on a case-by-case basis for how and where the training takes place. Factor in training cost, your budget and criticality of the training to your needs to decide which method to pursue.

Moreover, be smart on timing, Roberts says. If the intent of early training is simply to familiarize staff with a technology or application that will be brought in at a future date, tailor the course to be a short informational session rather than a full-blown training session.

Does your company have a program to enhance IS skills?

YES	59%
NO	41%

Who will provide the training?

VENDOR	42%
INTERNAL	25%
TRAINING FIRMS	20%
OTHER	13%

How will the budget for training change?

INCREASE	52%
STAY THE SAME	40%
DECREASE	8%

Source: Gartner Group, Inc., Stamford, Conn.; Open Line Communications Systems, Hartford

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SENIOR PROGRAMMER ANALYST

The Center for Computer Aided Design seeks two senior programmer analysts to work in object-oriented software development of a large scale integrated software environment for Concurrent Engineering of mechanical systems. The positions are temporary for up to one year, but may become permanent, depending on project funding. Responsibilities of these positions include software design and analysis, software implementation and maintenance, supervision of graduate research assistants, and collaboration with faculty and staff. Must have a Bachelor's (preferred Master's) degree in Computer Science or an equivalent combination of education and experience and at least 2-3 years experience in programming in C++, C, X/Motif, and UNIX, using computer aided software engineering (CASE) tools on a team environment. One analyst will lead the development and implementation of a design process management tool to be incorporated in the existing integrated software environment for Concurrent Engineering to define, support, and control multiple user operational activities. Experience with distributed network communication technologies is required. Previous programming experience in commercial software development is desirable. The second analyst position will support the software development of a durability and reliability analysis tool. Knowledge of multibody analysis, structural finite element analysis, structural fatigue analysis, or statistics-based structural reliability analysis is desirable. Must be self-motivated, demonstrating a high degree of initiative. Salary is based on qualification and experience.

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High school graduation and four years of experience as user support analyst manager or four years of experience as user support analyst or systems consultant required. Must have four years' work experience with manufacturing control systems, including three years of experience with TRITON system. Work experience must include system implementation and training. Work experience must include system design and customization/modification.

The position will require 40 hours per week, 8:30 a.m. to 5:00 p.m. Salary: $75,000 per year.

Applicants must send resume to 7310 Woodward Avenue, Room 415, Detroit, Michigan 48202. Reference number: 13195.

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If you desire challenge and outstanding opportunities with a world leader, we currently offer the following opportunities to join our Information Services Department.

UNIX System Specialist

Provide support for UNIX System V servers at a system level including file partitioning/slicing, system setup and UNIX package configurations. You will also develop K-shell scripts to remotely install packages and fixes.

Candidates should possess 3 or more years experience with UNIX System V, K-shell scripting, service hardware configuration TCP-IP and NFS, as well as structured testing methods.

ORACLE Database Analysts

Responsible for the design and generation of physical database structures, tuning SQL to improve performance, consult with application developers in the use of DBMS and SQL, and create/enhance standards for ORACLE database management.

Our environment extends to MVS/XA, DB2, SQL, CICS and data repository on our mainframes. Our UNIX client/server PC workstation environment includes Windows, ORACLE Connect/Gateway, ORACLE•SQLNet, ORACLE Forms 4.0, ORACLE•SQL and ORACLE PL/SQL.

Minimum of 3 years of experience in ORACLE database analysis, design and application implementation, as well as 1 year experience with ORACLE production database support, ORACLE application development and DB2 database design/development are required.

Development Managers

Manage all phases of applications development projects from initial business case through software release management. You will also lead teams in designing/implementing business strategic client/server based applications while managing client relations at all levels within our organization.

At least 6 years of applications development project management in a business environment and true PC or Client/Server project management experience are essential.

TOP-SECRET Security Specialist

Expand your expertise into security for our Client/Server environment by providing data security services in both the mainframe and Client/Server platforms while using your knowledge of TOP-SECRET to assist users with security issues/directions.

3 years of direct experience working with CA's TOP-SECRET security package in an MVS environment is essential. Some UNIX experience a plus.

All interested candidates must also have strong interpersonal skills, be team players, possess a solid combination of business acumen and technical aptitude and be willing to share their knowledge and expertise, as well as learn from others. Your interest in a career that emphasizes learning for the purpose of applying that knowledge to solve business problems is also critical to your success.

We recognize experience and reward it by offering an attractive compensation package that includes full benefits. If you feel that you can contribute your talents to our progressive organization, we encourage you to forward your resume to include salary history to

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SR. SYSTEMS ANALYST

This position offers a highly motivated Sr. Systems Analyst the opportunity to communicate extensively with PHCS internal customers, clients, and outside industry sources to prepare business analysis, user requirement documents, and systems designs, as well as support reverse and reengineering efforts. Qualified applicants need at least 5 years of increasingly responsible business and systems analysis, system design, development and implementation experience. A technical degree is required. **Dept. CD/SA**

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Senior Systems Analyst: Provide development, maintenance and production support for Power Generation and Distribution System, Power Equipment and Materials Management System Online and Batch Billing System for utilities, and Batch Deposit reports including maintenance of billing subsystems using knowledge of INSTALL/1 2.1 COBOL II DB2/SQL, IMS DB/DC CICS PROTON MVS/JCL, VSAM in IBM 3090 environment with extensive use of DB2 utilities for managing data. Provide support for the development of data windows for inventory control subsystems using POWERBUILDER. Must have Bachelor's degree in Computer Science and Engineering and 2 yrs exp in position or 2 yrs as a Systems Analyst. $43,000/yr. 40 hrs/wk, 8-5. Submit resume to Job Service of Florida, 2660 W Oakland Park Blvd Ft Lauderdale, FL 33311-1347 Re: Job Order # FL #163663

Software Engineer: Provide specialized consulting services to customers in various industries, design & develop applications in a multi-hardware multi-software environment on IBM AS/400 & VAX platforms with QUERY/400 OS/400 DECForms SQL platforms Relational DataBase Management System (RDBMS), Cobol SDA VMS & Client Language (CL), install new systems & conform electrical circuits to support applications, manage data-migration integration & user training across different platforms, provide on-site troubleshooting & user support, modify systems & update user manuals. $38,000/yr 40 hr/wk M-F U.S. or foreign equivalent B.S. Computer Engineering or C.S. & 2 yrs exp as Software Eng. Systems Analyst or Programmer-Analyst. Job Location: Chattanooga. Submit resume to Dept of Employment Security, P.O. Box 11088, Chattanooga, TN 37401 ATTN J.O. #TN1618974

PROGRAMMER/ANALYST: Develop new software using C and C++ languages, for WindowsNT operating systems utilizing SDK and SQL. Evaluate user request for new or modified computer program to determine feasibility, cost and time required, compatibility with current system and computer capabilities. Train users to use program and provide technical assistance, install and test program at user site, and monitor performance of program after implementation. Require Bachelor's Degree in Computer Science or Engineering, 2 years verifiable experience as Programmer/Analyst with detailed working knowledge of WindowsNT, SQL and SDK, C and C++ languages. Salary $42,000. Resume to Ms. Pat Gonno, Job Service of Florida, P.O. Box C, Clearwater, FL 34618-4090. Work site in Tampa Bay area, Florida.

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Systems Development: Sybase and/or Informix relational database design and development skills. C, C++, GUI, PowerBuilder and Neuron Data or Hog a plus. **Dept. SSA-SD/CW**

Senior Programmer/Analyst

You'll need 4-5 years of data processing experience, including 1-2 years in analytic role, to handle complex coding, testing and implementation projects. Familiarity with Sybase/Relational Database Development, Access, PowerBuilder, FoxPro, VSAM, COBOL and Foxbase a must. **Dept. SPA/CW**

Programmer/Analyst

You'll need 3-4 years experience in an MVS environment to participate in key systems development activities. COBOL, UNIX, 4GL, JCL, TSO/SPF, VSAM, CICS and IBM Utilities required. FoxPro preferred. **Dept. PA/CW**

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Work with Customer Service/Systems Personnel to implement automated call handling applications. BS/BA and 1-2 years developing VRU scripts required; UNIX/C desired. **Dept. VRUS/CW**

Network Administrator

3-5 years experience administering local ethernet and wide area TCP/IP-UNIX networks. Knowledge of SunOS/Solaris, NFS, NIS/DNS administration, X-windows, SNMP, router configuration and MS Windows a must. **Dept. NA/CW**

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5-7 years experience in technical and/or supervisory role including knowledge of client/server, RDBMS, Windows, SQL and 4GL's.

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1-5 years experience with three of the following areas: UNIX, Windows, C/C++, client/server, lexical analyzers & translators, RPC or sockets.

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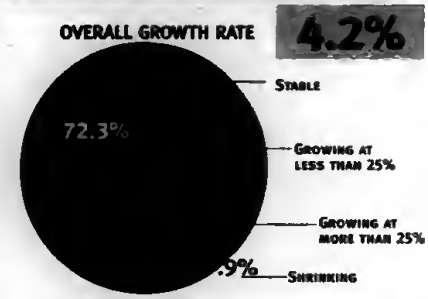

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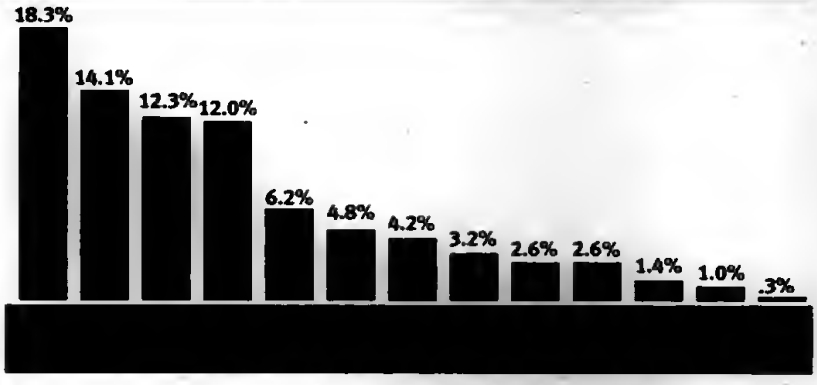

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■ COLOR PRINTERS HAVE COME A LONG WAY, BUT THEY'RE CREATING HEADACHES FOR IS. SEE CW GUIDE TO COLOR PRINTERS, PAGE 90.

The seduction of color

You may love the color but hate the cost of supplies associated with color printers

By Alan R. Earls

If you're accustomed to the maturity and reliability of black-and-white printers but seduced by color, you may be in for a surprise when it's time to foot the bill for maintenance and supplies.

Hard numbers and good "apples to apples" comparisons are hard to come by for the various color printer technologies, says Charles LeCompte, editor of the "Hard Copy Observer," a newsletter in Newton, Mass. But the cost differences between black-and-white, or monochrome, and color printers can be vast when it comes to items such as paper, toner and maintenance.

Seeing red

Where data is available, it shows that the cost to operate and maintain some color printers is several times that of monochrome printers with similar resolution and ink or toner density.

For example, LeCompte cites manufacturers' figures showing that color laser printers from QMS, Inc. or Xerox Corp. produce copies that use supplies worth up to 26 cents per page. In contrast, operating monochrome laser printers rarely costs more than 2 cents or 3 cents per page; monochrome ink-jet printers are nearly as frugal at 3 cents to 6 cents per page.

Because most monochrome technologies are mature, models from various companies cost about the same to operate. But in the less developed world of color, manufacturers not only have widely varying costs for supplies and maintenance, but also different ideas of what constitutes a standard page. That makes comparisons difficult.

Staying in the black

"The color ink-jet technology is fairly mature, but it is hard to gauge the real cost in a corporate setting," says John Goetz, a senior industry analyst at Dataquest, Inc. in San Jose, Calif.

"That's because most units are inexpensive enough that users simply don't bother with a service contract," he adds. Because service contracts can cost up to $2,000 a year, users often rely on the one- or two-year manufacturer's warranty for protection, Goetz says. That hides operational costs — at first by warranty coverage and later by the fact that owners may replace troublesome units rather than seek expensive repairs.

On the other hand, the true costs of color laser printing — the newest and generally most expensive of the desktop technologies — are unclear. At the moment, Goetz says, there are simply too few units in the field — most still on warranty — to gauge their expense.

For those who must have color, analysts say it pays to shop around. For example, LeCompte says the cost of supplies can vary by manufacturer; and buying them in bulk may help users get better maintenance deals, says Bob Fennel, director and principal analyst at Dataquest.

But the best strategy may be to wait for the color printer market to mature. LeCompte notes that maintenance costs are still an unknown.

"These technologies are more complex [than monochrome], and even if [the printers] don't break down, you still have to open them up to change things much more often," he says.

Given the appeal of color and the aggressive pricing of units, however, a more mature market may not be far off. "The ink-jets will probably dominate in terms of the number of units sold and the revenue they generate," Goetz says. "But color laser, as the newer technology, will probably have a stronger growth rate." ■

Earls is a freelance writer in Franklin, Mass.

Too soon to tell

The cost of operating color printers has been obscured by the relatively low number of units in the field and the fact that many units are still under warranty, according to Dataquest.

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Thermal transfer	*Excellent color quality*	*Unknown maintenance costs, very high black and white print costs*	*Up to $2.50 per page*

Sources: "Hard Copy Observer," Newton, Mass.; Dataquest, Inc., San Jose, Calif.

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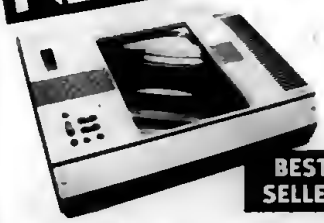

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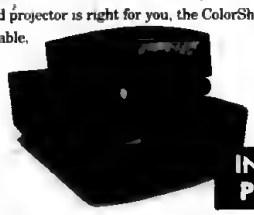

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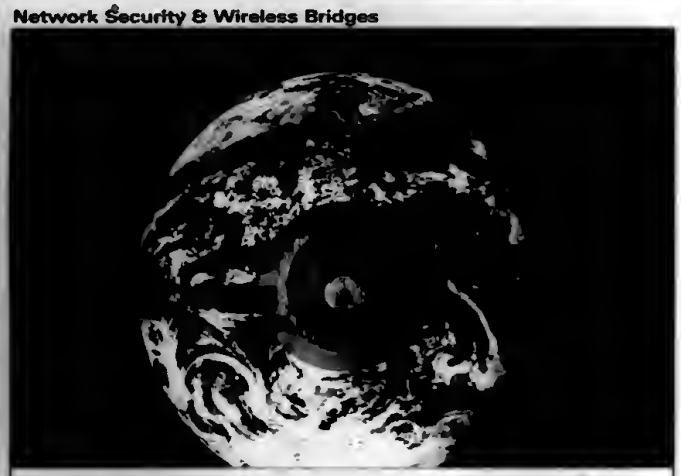

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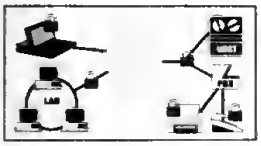

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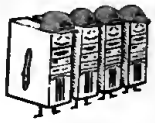

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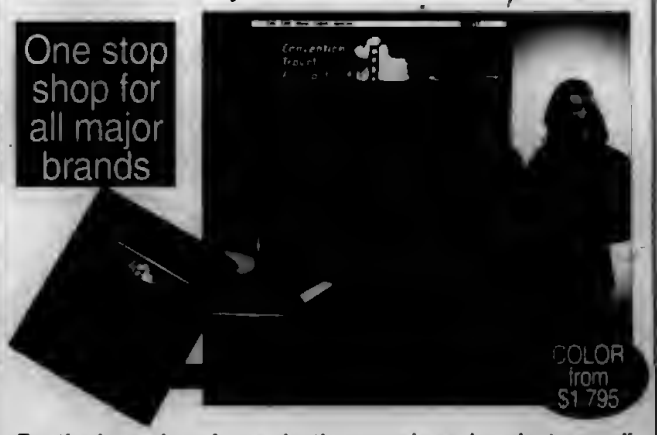

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Jan. 6 Stock Ticker

Gainers / Losers

Percent

Gainers		Losers	
Data Race Inc.	51.7	Sapiens Intl. Corp. N.V.	-51.7
Iomega Corp.	28.3	ViewLogic Systems(L)	-44.5
Cray Computer	27.3	Interleaf Inc.	-11.1
CE Software(L)	26.7	Scientific Atlanta Inc.	10.7
RasterOps	26.3	Intelligent Info. Systems	50.0
State of the Art	24.1	Peoplesoft(H)	-9.9
Radius Inc.	23.5	McAfee Associates(H)	-9.8
Advanced Logic Research	20.0	Xylogics Inc.	-9.7

Dollar

Gainers		Losers	
Progress Software Corp.	5.13	ViewLogic Systems(L)	-8.13
Dell Computer Corp	4.25	Powersoft(H)	-4.88
Legent Corp	3.75	Texas Instruments	-4.13
Apple Computer Inc.	2.88	Peoplesoft(H)	-3.25
Advanced Micro Devices	2.50	IMRS	-3.25
Zilog Inc.	2.25	Sybase Inc.	-3.25
Sierra Semiconductor(H)	2.13	US Robotics	-3.13
Radius Inc.	2.00	Policy Management Sys.	-2.88

[redacted]

It's in the chips for tech stocks

1994 was a strong year for technology stocks, which were outpaced only by footwear and pharmaceutical shares. The multiplicity of winners benefited from different trends, however.

Chip maker **LSI Logic Corp. (LSI)** followed the success of the surging semiconductor segment, as did **Micron Technology, Inc. (MU)**, which posted its second straight year of top gains.

3Com Corp. (COMS) led networking issues on the basis of strong earnings, while **Centigram Communications Corp. (CGRM)** and **Newbridge Networks Corp. (NNXCF)** went from tops in 1993 to flops in 1994, dropping 21½ and 16½ points, respectively. Centigram suffered weaker sales and an operating loss late in the year. In August, Newbridge shares plunged after the company reported lower-than-expected earnings.

Dell Computer Corp. (DELL) rode the PC boom to gain the most among PC makers, although **Compaq Computer Corp.**'s **(CPQ)** stock gained 14 points, mirroring its overall sales leadership in the PC market.

On the high end, **IBM** finished up major restructuring efforts and led large systems vendors with a 17-point increase from 56½ to 73½. A report by Barry Bosack, an analyst at Smith Barney Shearson, Inc. in New York, projects IBM's stock will hit the mid-90s in 1995.

One Wall Street newcomer, **Fore Systems, Inc. (FORE)**, has not stopped growing since its initial public offering in May 1994. News of **Powersoft Corp.**'s **(PWRS)** sale to Sybase, Inc., expected to be approved in March, sent Powersoft shares through the roof. *—Tim Ouellette*

The best and the rest

Company name	12/30/93	12/30/94	Change 94*
The best			
Fore Systems	23 3/8	67 1/2	+43 7/8
Powersoft	41	82 1/2	+41 1/2
Microtouch Systems	6 7/8	45	+38 1/8
Broderbund Software	17 1/4	46 3/4	+29 1/2
3Com	23 1/2	51 9/16	+28 1/16
Micron Technology	18 1/8	44 3/8	+25 1/2
The rest			
Centigram Communications	35 1/2	14	-21 1/2
4th Dimension Software	23 7/8	4 5/32	-19 23/32
Sapiens Software	19	1 25/32	-17 7/32
Newbridge Networks	54 3/4	38 1/4	-16 1/2
Lotus	55	41	-14

*Stock splits during the year are reflected in prices

Exch	52-Week Range			Jan. 6 3 PM	Wk Net Change	Wk Pct Change
Communications and Network Services						**OFF [illegible]**
OTC	53.25	20.11	3COM Corp	49.25	-2.50	-4.8
NYS	43.38	36.25	Ameritech Corp	40.25	-0.88	-2.1
NYS	57.13	47.25	AT&T	48.25	-2.38	-4.7
OTC	19.75	12.75	Banyan Systems Inc	18.25	0.13	0.7
OTC	43.88	18.63	Bay Networks Inc.	29.63	0.25	0.9
NYS	58.38	48.38	Bell Atlantic Corp	48.38	1.50	3.0
NYS	63.50	50.50	BellSouth Corp	54.50	0.13	0.3
NYS	21.50	10.00	Bolt Beranek & Newman	14.88	0.13	0.8
OTC	15.75	9.00	Brooktrout Technology	10.88	-0.63	-5.4
NYS	53.00	33.06	Cabletron Systems	46.25	-1.25	-5.8
OTC	63.00	10.00	Centigram Communications	14.75	0.50	3.6
OTC	50.50	21.00	ChipCom Corp	45.38	2.88	8.0
OTC	40.75	18.75	Cisco Systems Inc	34.00	-0.75	-2.3
OTC	16.13	6.12	Compression Labs Inc	7.81	-0.08	-0.8
OTC	12.38	5.13	Computer Network Tech	6.88	0.00	0.0
OTC	25.75	7.50	CrossComm	11.63	0.13	1.1
OTC	3.00	2.00	Data Switch Corp	2.50	0.00	0.0
OTC	37.88	17.88	DSC Communications	34.38	1.88	5.2
OTC	71.50	20.00	FORE Systems Inc	66.25	1.38	2.0
NYS	34.88	8.21	General Datacomm Inds.	33.63	1.75	5.9
NYS	35.25	29.50	GTE Corp	30.13	-0.50	-1.6
NYS	95.97	77.00	ITT Corp	87.00	2.50	2.9
OTC	28.38	12.25	MCI Communications Corp.	17.88	-0.25	-1.4
OTC	15.75	8.13	MICOM Communications Corp	8.75	0.13	1.6
OTC	12.38	6.50	Microcom Inc.	13.88	0.13	1.3
OTC	9.75	4.00	Netrix Corp (H)	9.75	0.25	2.6
OTC	8.75	3.25	Network Computing Devices	4.63	0.75	19.4
NYS	24.75	2.38	Network Equipment Tech.	23.75	-0.63	-2.6
OTC	26.12	13.88	Network General (H)	24.00	-2.06	-7.9
OTC	8.63	6.38	Network Systems Corp	7.00	0.00	0.0
NYS	68.75	26.50	Newbridge Networks Corp	36.50	-1.63	-4.3
NYS	37.75	26.00	Northern Telecom Ltd.	37.00	-0.38	1.1
OTC	26.63	13.38	Novell Inc.	17.13	-0.13	-0.7
NYS	41.38	33.25	Nynex Corp	37.75	0.13	0.3
OTC	30.00	16.50	Octel Communications Corp	21.50	0.63	3.0
OTC	29.88	10.75	Optical Data Systems Inc.	29.88	0.13	0.4
OTC	7.50	2.13	Penril DataComm Networks	2.38	-0.03	-1.3
OTC	24.50	10.00	PictureTel Corp (H)	21.23	-0.86	3.6
OTC	7.88	2.13	Proteon Inc.	5.63	0.00	0.0
OTC	14.38	2.75	Racotek Inc.	5.19	-0.19	-3.6
OTC	13.75	3.75	Retix	4.38	0.38	8.4
NYS	23.25	12.06	Scientific Atlanta Inc	18.75	2.23	10.7
NYS	46.38	36.75	SouthwesternBell Corp	40.00	-0.18	-0.4
NYS	40.13	26.13	Sprint Corp	26.88	-0.50	1.8
OTC	30.38	13.38	Standard Microsystems Corp (H)	28.38	1.75	5.8
OTC	37.25	6.50	Stratacom Inc. (H)	34.25	-1.75	-4.9
OTC	15.25	3.88	Telebit Corp	5.00	0.63	14.1
OTC	46.00	24.00	US Robotics	40.75	3.13	7.1
NYS	45.00	34.61	US West Inc.	36.25	0.50	1.4
OTC	28.25	12.75	Xircom	17.75	0.00	0.0
OTC	27.06	7.88	Xylogics Inc	31.25	2.50	8.7
PCs and Workstations						**UP 2.50%**
OTC	7.50	3.50	Advanced Logic Research	4.50	0.75	20.0
OTC	43.75	24.63	Apple Computer Inc	42.13	2.88	7.3
OTC	33.00	10.38	AST Research Inc	33.63	1.00	-6.8
NYS	42.13	25.66	Compaq Computer Corp.	39.38	-0.25	-0.6
OTC	47.38	19.11	Dell Computer Corp.	45.13	4.25	10.4
OTC	26.00	9.25	Gateway 2000 Inc.	23.00	1.38	6.4
NYS	102.50	71.88	Hewlett Packard Co.	100.00	-0.88	-0.9
NYS	33.13	18.75	Silicon Graphics	30.00	1.11	3.8
OTC	37.63	18.23	Sun Microsystems Inc	34.50	-1.38	3.8
NYS	50.75	30.75	Tandy Corp (H)	49.00	-0.38	-0.7
OTC	9.00	2.38	Zeos International Ltd	8.13	0.00	0.0
Large Systems						**UP 2.48%**
ASE	11.25	5.25	Amdahl Corp (H)	10.63	0.38	3.4
NYS	9.60	6.38	Convex Computer	7.50	-0.25	-3.2
OTC	2.88	0.50	Cray Computer	1.31	0.28	27.3
NYS	33.75	14.63	Cray Research Inc	18.38	1.38	8.2
NYS	12.00	6.63	Data General Corp	9.88	0.00	0.0
NYS	38.13	18.25	Digital Equipment Corp	34.13	0.88	2.6
OTC	6.38	2.38	Encore Computer Corp	3.03	-0.03	1.0
OTC	17.50	6.50	Harris Computer Systems Corp	11.50	-0.75	6.1
NYS	76.38	51.38	IBM	75.00	1.38	1.9
OTC	17.50	7.13	NetFrame	7.50	-0.38	-4.8
OTC	14.23	3.63	Parallan Computer (L)	3.25	0.13	3.2
OTC	16.50	5.38	Pyramid Technology	12.50	-0.50	-3.8
OTC	20.63	11.13	Sequent Computer Sys.	20.25	0.31	1.6
OTC	6.84	3.13	Sequoia Systems Inc	3.94	0.25	6.8
NYS	39.00	22.00	Stratus Computer Inc.	16.75	-0.50	1.3
NYS	19.13	10.50	Tandem Computers Inc	17.75	0.38	2.2
OTC	25.50	3.88	TriCord Systems	6.25	0.94	17.6
NYS	36.50	8.75	Unisys Corp	9.00	0.38	4.3
Software						**UP 0.35%**
OTC	38.50	21.50	Adobe Systems Inc	30.50	0.19	0.6
OTC	6.50	2.63	American Software Inc.	3.00	0.11	6.3
OTC	61.50	28.33	Autodesk Inc.	38.50	1.25	3.1
OTC	3.88	1.75	Bachman Info. Systems	1.88	-0.13	3.1
OTC	29.00	20.50	BGS Systems Inc.	27.00	2.25	8.9
OTC	71.00	40.25	BMC Software Inc	58.88	1.13	2.0
OTC	26.25	15.00	Boole & Babbage	25.75	0.13	0.3
OTC	15.88	6.00	Borland Int'l Inc (L)	6.63	0.50	8.2
OTC	25.00	6.00	Brock Control Systems Inc	7.00	0.63	9.8
OTC	4.00	1.78	CE Software (L)	2.38	0.50	26.7
ASE	30.34	6.25	Cheyenne Software Inc.	14.13	0.50	3.7
OTC	18.00	9.75	Cognos Inc	16.50	-1.50	-8.5
NYS	50.88	27.38	Computer Associates	48.75	0.13	0.3
NYS	5.38	2.50	Computervision Corp.	4.00	0.25	6.7
OTC	69.25	33.00	Compuware Corp	56.00	1.00	2.0
OTC	34.75	9.88	Conshare Inc.	11.50	0.00	0.0
OTC	16.75	10.66	Corel Corp	14.00	0.00	0.0
OTC	34.25	7.75	Dataware Technologies Inc	11.25	0.50	4.7
OTC	6.75	2.25	Easel Corp	3.00	0.25	9.1
OTC	29.25	14.25	Filenet Corp.	26.50	0.00	0.0
OTC	25.00	3.00	4th Dimension	4.25	-0.03	-0.7
OTC	38.00	8.13	Frame Technology	15.50	1.56	9.2
OTC	35.50	31.50	FTP Software Inc (H)	30.75	-1.50	-4.7
OTC	11.00	7.00	Group 1 Software	9.25	0.00	0.0
OTC	31.75	6.75	Gupta	12.85	1.13	9.8
OTC	10.88	3.13	Hogan Systems Inc.	6.00	-0.25	-4.0
OTC	40.25	18.00	IMRS	36.00	3.25	-8.3
OTC	39.75	11.25	Information Resources	35.13	3.63	12.0
OTC	32.13	14.25	Informix Corp (H)	30.75	-1.00	-3.1
OTC	11.25	7.38	Intergraph Corp	8.50	1.13	13.4
OTC	8.75	2.50	Interleaf Inc.	3.00	-0.38	-11.1
OTC	18.25	8.63	Intersolv Inc (H)	16.50	1.50	-8.3
OTC	73.25	27.00	Intuit Inc.	68.00	1.38	2.1
OTC	10.75	2.25	KnowledgeWare Inc	3.06	0.00	0.0
OTC	34.75	19.00	Legent Corp	33.00	3.75	12.8
OTC	86.50	29.25	Lotus Development	39.00	-1.00	-2.4
OTC	17.75	4.38	Magic Software Enterprises	5.88	0.38	6.8
OTC	15.50	8.00	Manugistics Group Inc	9.25	1.25	15.6
OTC	27.50	14.75	Mapinfo Corp	23.75	-1.73	-6.9
OTC	7.50	1.44	MathSoft	2.25	-0.13	-5.3
OTC	20.25	6.50	McAfee Associates (H)	17.81	-1.94	-9.8
OTC	17.25	9.38	Mentor Graphics	14.63	-0.75	-4.9
OTC	20.00	11.50	Micro Focus	13.63	0.25	2.0
OTC	11.03	4.61	Micrografx Inc.	7.63	1.00	15.1
OTC	63.13	39.00	Microsoft Corp.	60.38	0.88	1.4
OTC	45.00	11.25	NetManage Inc.	41.50	1.75	4.4
OTC	46.50	20.25	Oracle Corp	43.00	1.50	3.4
OTC	39.75	21.50	Parametric Technology	32.81	1.61	4.7
OTC	26.50	13.38	ParcPlace Systems Inc.	20.00	1.00	4.8
OTC	39.50	13.00	Peoplesoft (H)	34.25	3.75	8.9
OTC	8.13	4.00	Phoenix Technologies	2.75	0.00	0.0
OTC	84.00	35.50	Powersoft (H)	77.75	4.00	5.3
OTC	22.50	3.50	Platinum Software	12.13	-0.61	-4.9
OTC	21.75	10.00	Platinum Technology	27.25	0.13	0.8
OTC	56.75	27.00	Progress Software Corp.	63.00	5.19	12.5
OTC	6.11	3.69	Quarterdeck Office Sys.	5.11	0.13	4.2
OTC	24.00	9.50	Rainbow Technologies Inc.	14.88	1.00	7.2
OTC	9.25	2.00	RasterOps	3.16	0.66	26.3
OTC	7.13	2.88	Ross Systems	3.13	0.25	5.3
OTC	23.25	0.16	Sapiens Intl. Corp. N.V.	0.88	-0.94	-51.7
OTC	27.25	9.75	Softkey International Inc	24.31	-0.81	3.2
OTC	8.38	3.00	Software Publishing Corp	3.00	0.63	34.3
OTC	10.00	3.00	State of the Art	8.38	1.63	24.1
NYS	36.88	25.00	Sterling Software Inc. (H)	34.50	2.25	-6.1
OTC	10.38	3.63	Struct. Dynamics Research	6.25	0.00	0.0
OTC	67.00	31.25	Sybase Inc	49.00	-3.25	-6.3
OTC	19.63	9.88	Symantec Corp	17.38	-0.13	1.8
OTC	48.75	23.00	Synopsys	44.00	1.00	2.3
OTC	38.00	10.63	System Software Assoc.	15.50	0.50	-3.1
OTC	6.75	3.23	Trinzic Corp	5.75	0.25	4.5
OTC	30.00	9.50	ViewLogic Systems (L)	10.13	-8.13	-44.5
OTC	23.25	12.25	VMark Software Inc.	16.75	-0.50	2.9
OTC	13.25	5.50	Walker Interactive Systems	7.25	0.50	7.4
OTC	60.00	29.25	Wall Data Inc.	40.25	0.25	0.6
Semiconductors						**UP [illegible]**
NYS	31.75	16.75	Advanced Micro Devices	27.25	2.50	10.1
NYS	24.50	15.81	Analog Devices Inc	21.25	-1.29	-3.3
OTC	37.63	17.13	Atmel Corp	32.81	-0.44	1.7
OTC	7.88	3.61	Chips and Technologies	7.48	1.13	16.7
OTC	44.63	21.00	Cirrus Logic	25.00	1.00	8.1
NYS	24.13	13.75	Cypress Semiconductor Corp	22.25	0.63	2.7
NYS	20.13	13.38	Dallas Semiconductor	15.63	-0.75	-4.6
OTC	31.50	34.75	Integrated Silicon Systems (H)	29.50	1.50	-4.8
OTC	73.50	56.00	Intel Corp	64.38	0.88	1.4
NYS	45.38	16.25	LSI Logic Corp.	38.75	1.00	4.8
OTC	20.13	14.00	Lattice Semiconductor	17.13	0.38	2.2
NYS	45.88	20.11	Micron Technology	42.63	-2.25	5.0
NYS	61.13	43.13	Motorola Inc	57.63	-0.75	1.3
NYS	25.88	14.38	National Semiconductor	19.13	-0.25	-1.3
OTC	17.50	6.75	Sierra Semiconductor (H)	17.50	0.13	53.8
NYS	80.50	63.23	Texas Instruments	73.13	-4.13	-5.3
OTC	36.38	10.23	VLSI Technology	12.00	0.13	1.1
OTC	10.00	1.78	Weitek (L)	2.06	0.39	18.0
ASE	20.38	10.75	Western Digital Corp	18.13	0.25	1.5
OTC	67.00	29.00	Xilinx	56.75	1.50	2.6
OTC	37.75	24.75	Zilog Inc	31.50	2.25	7.7
Peripherals and Subsystems						**UP [illegible]**
OTC	30.50	24.50	American Power Conversion	17.19	0.56	3.4
OTC	27.25	18.75	BancTec Inc	19.75	0.50	2.6
OTC	5.97	3.25	Cambex Corp.	3.61	0.00	0.0
ASE	5.25	1.38	Cognitronics Corp	2.75	0.25	12.5
NYS	20.50	9.00	Conner Peripherals	10.13	0.88	9.5
OTC	24.00	9.25	Creative Technologies Inc.	14.25	0.50	3.6
OTC	11.00	3.50	DataRace Inc.	4.50	1.88	51.7
ASE	9.00	4.13	Dataram Corp	7.25	1.00	16.0
NYS	24.00	12.38	EMC Corp	21.69	-0.38	-1.7
OTC	13.88	3.13	Emulex Corp. (H)	13.88	0.50	3.7
OTC	21.00	11.75	Evans & Sutherland	12.75	0.00	0.0
OTC	34.00	14.00	Exabyte	20.00	1.38	-6.4
OTC	26.00	2.75	Intelligent Info. Systems	2.25	-0.75	50.0
OTC	4.25	1.59	Iomega Corp	4.25	0.94	28.3
OTC	9.75	2.13	IPL Systems Inc.	3.38	0.00	0.0
OTC	28.88	15.75	Komag Inc.	27.00	1.13	4.2
OTC	8.61	2.63	Maxtor Corp	4.44	0.06	1.9
OTC	10.00	4.88	Micropolis Corp	10.00	1.13	11.7
OTC	20.50	9.25	Pinnacle Micro Inc	15.13	1.38	14.1
OTC	20.75	6.31	Printronix Inc.	26.50	0.00	0.0
NYS	30.75	6.88	QMS Inc	9.00	0.25	2.9
OTC	30.23	11.63	Quantum Corp.	14.88	0.00	0.0
OTC	18.25	7.38	Radius Inc	10.50	2.00	23.5
NYS	55.13	6.38	Recognition International	9.13	0.11	1.6
OTC	6.88	0.13	Rexon Inc	5.00	0.00	0.0
OTC	28.75	18.83	Seagate Technology	24.63	0.00	0.0
NYS	41.50	25.00	Storage Technology	32.50	1.38	4.8
NYS	60.50	24.63	Tektronix Inc	34.75	0.25	0.7
NYS	112.75	90.75	Xerox Corp	98.63	-0.50	-0.5
Services						**UP [illegible]**
OTC	19.88	12.00	American Mgmt. Systems (H)	18.63	1.00	5.7
NYS	6.25	1.75	Anacomp Inc	1.88	-0.10	-6.9
OTC	21.25	14.50	Analysts Int'l	21.25	1.13	5.6
NYS	59.75	47.63	Auto Data Processing	58.50	-0.38	0.6
OTC	21.75	14.00	Cambridge Tech. Partners	22.13	-0.13	0.6
NYS	27.50	19.00	Ceridian Corp	27.00	0.00	0.0
NYS	24.25	17.75	Comdisco Inc	22.50	-0.88	2.2
OTC	16.75	2.75	Computer Horizons	35.00	0.75	1.7
NYS	52.63	31.63	Computer Sciences (H)	49.38	2.75	5.9
NYS	10.38	6.75	Computer Task Group	8.75	0.13	1.5
NYS	22.25	6.75	CompUSA Inc	16.13	1.13	7.5
OTC	11.38	1.38	Control Data Systems Inc.	6.13	0.50	7.1
OTC	12.11	6.13	Egghead Discount Software	11.13	-0.50	-4.1
NYS	39.50	27.50	General Motors E (EDS)	38.88	0.00	0.0
OTC	21.00	6.88	Inacom Corp	7.19	0.16	2.2
OTC	37.50	7.50	Intelligent Electronics	8.01	0.50	-6.0
OTC	22.50	6.25	Merisel	8.13	0.13	1.5
OTC	32.50	9.25	Microage Inc	12.00	0.13	1.1
OTC	40.75	20.50	Paychex	40.50	0.25	0.6
NYS	47.75	25.75	Policy Management Sys.	19.13	-2.88	-9.8
NYS	28.25	10.75	Reynolds and Reynolds	24.63	-1.58	-6.0
OTC	28.50	16.25	SEI Corp (L)	18.75	1.50	8.7
OTC	34.50	22.13	Shared Medical Systems	32.50	-0.25	-0.8
OTC	8.33	4.00	SHL Systemhouse	5.63	0.44	8.4

KEY: (H) = New annual high reached in period (L) = New annual low reached in period
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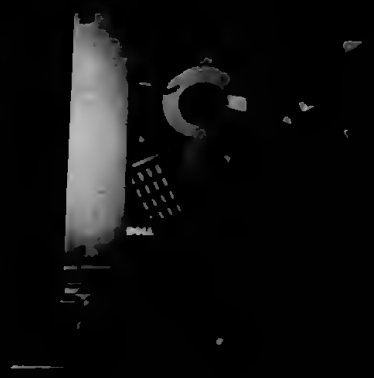

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([A]Actual battery life will vary depending on nature and frequency of use and configuration.)

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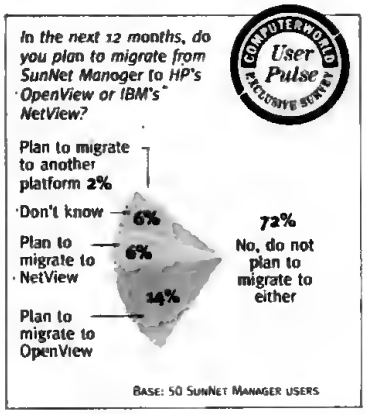
Sun enhances

CONTINUED FROM PAGE 1

will allow regional users to continue normal systems management in the event of outages elsewhere.

Sun officials had no comment last week on the upcoming announcement. Products are expected to ship in the third quarter, analysts said.

Encompass and Solstice, which run under the Solaris 2.x Unix operating system, will benefit mainly large-site users, who have been clamoring for more comprehensive network and systems tools [CW, Oct. 10]. But many large shops already use more than one network management platform (see chart), and the trend toward distributed management is likely to sweep all major platforms by 1997, analysts said.



SunNet Manager already manages computers with many different operating systems, such as IBM's AIX and HP's HP/UX, through the use of industry-standard Simple Network Management Protocol interfaces with remote devices over TCP/IP networks. Sun's Encompass network management platforms — running Solaris 2.x — will also tap the Desktop Management Interface to manage Windows LAN servers and Unix servers.

Analysts said Encompass, which is based on licensed NetLabs, Inc. code, must deal with the following three trends in network management:

- A shift away from host-centric monitoring to distributed, self-healing domains that minimize network traffic.
- Increasing reliance on distributed, object-oriented databases rather than large host databases to store operational data.
- The integration of network, systems and application management.

Sun's main challenge, users and industry analysts agreed, will be to turn the tide against the marketing momentum gained by Hewlett-Packard Co.'s OpenView and IBM's NetView/6000 network management products. Both rivals have outpaced SunNet Manager, whose market share declined from 38% in 1992 to 35% in 1993 and is expected to slip below 35% for 1994, according to International Data Corp. (IDC) in Framingham, Mass.

On their own

Meanwhile, many large Sun sites have found they do not need SunNet Manager and have written their own systems management solutions. At CS First Boston in New York, users feed data from homegrown systems management applications, as well as OpenVision Technologies, Inc. applications, into Cabletron Systems, Inc.'s object-oriented Spectrum network management console, said information systems manager Jim Swanson. CS First Boston has 1,000 Sun devices, including about 200 Sun servers.

Some sites combine Sun workstations with OpenView, which already has some systems management add-ons. A *Computerworld* survey conducted among 50 Sun shops last week, for example, showed that 30% of the respondents used OpenView in addition to SunNet Manager, and another 12% used NetView along with SunNet Manager.

Charles Schwab & Co., for example, uses OpenView to manage hundreds of Sun workstations and Tivoli Systems, Inc.'s Tivoli Management Environment systems management framework in its Phoenix data center.

While Sun now appears to be leapfrogging its competitors in distributed technology, analysts said the company's future success hinges on persuading SunNet Manager users to migrate to the next-generation products.

Also critical for Sun is persuading independent software vendors to port their applications to Encompass. "We're trying to reduce our support burden, not increase it," said Dave Abbajay, a senior consultant for network management at Cisco Systems, Inc. The firm's CiscoWorks product runs on Sun, IBM and HP platforms. Sun is expected to ship one set of application programming interfaces for SunNet Manager and Encompass, analysts said.

ATM technology slowed by lack of tools, standards. See page 57.

Mobile users trek rocky road

CONTINUED FROM PAGE 1

As a result, outfitting and supporting mobile users — whose numbers are growing daily — with the same applications used in the home office has become a time-consuming and costly effort. While there is some relief in sight, it has been slow to arrive (see story below).

This is not good news for many corporations. We are "becoming more and more reliant on the ability to communicate with traveling executives as well as the sales force and even customers," said Peggy Pisani, a business consultant at Baxter HealthCare Corp. in McGaw Park, Ill.

Venturing into the unknown

Meanwhile, users preparing to launch major mobile projects are discovering that much like the early seafaring maps, there are dragons in the unknown territory outside the office. Mobile versions of standard desktop software until recently have been treated as afterthoughts, leading to more IS headaches, analysts said.

For example, nearly all applications ship a mobile version of the application well after the desktop version ships, requiring IS to do two installs of the same application. Also, there is no way to distribute or update the application electronically.

While the timing of these different versions needs to be synchronized, the technology required for mobile users to implement this technology is very different. Because portable computers use different components, such as hard drives that stop spinning to conserve battery power, applications have to be optimized not to overload the system requirements, said Andrew M. Seybold, editor of the "Outlook on Communications and Computing" newsletter in Brookdale, Calif.

What can be even worse is when users are forced to use software that clearly is not optimized for mobile users.

For example, Lotus Development Corp.'s popular Notes application requires the same client for the mobile user as for the networked one. Each time a mobile user connects into Notes, all the replicated data is copied over to the mobile user. The result is that some users have to wait a long time for the replication to run its course.

"I want to see Lotus address performance [for Notes]: I never hear them talk about performance, and it's slow," said Kevin Danehy, manager of workgroup application development at Millipore, Inc. in Bedford, Mass. He said jumping from one view to another can take three to four minutes.

"Lotus' Notes is not good for mobile users," griped one anonymous IS planner at a Fortune 500 transportation company. "Windows is not good for remote users either. It crashes all the time. Microsoft blames database vendors, database vendors blame the network; you get a lot of finger-pointing," the user added.

> While vendors are aware of their product shortcomings, they are also aware of the market opportunities. They are scurrying to provide new features in their applications that will make them more mobile-friendly.

While vendors are aware of their product shortcomings, they are also aware of the market opportunities. They are scurrying to provide new features in their applications that will make them more mobile-friendly.

Space savers

The competition to be mobile-friendly is already bearing fruit. In the last version of Office, Microsoft offered a mobile option under which a stripped-down version of the application suite is automatically installed.

Lotus and WordPerfect, the Novell, Inc. Applications Group, are following suit. Both are now shipping versions of their suites that enable users to load a slimmed-down version of their hard drive-absorbing suites.

The results have been dramatic. For example, the Lotus minimum option can cut the size of SmartSuite down to one-third its default size, or to 93M bytes of hard drive space.

Sales forces warm to notebook possibilities. See page 41.

Design dilemmas

Mobile applications have their own special legacy effect to overcome. Many of the problems associated with mobile applications occur because they were designed with the desktop user, not the mobile user, in mind. The same is true even of the newest breed of applications — groupware.

"Applications in the last several years were designed with the LAN view, which means that developers made the basic assumption that they will have an infinite highway" for data, said Jack Blount, chief executive officer of Mobileware, Inc. The Richardson, Texas, start-up offers a product that acts as middleware between LAN and mobile users.

Blount said developers at IS organizations have to deal with limited bandwidth for their mobile users. An infinite data pipe for mobile users "isn't true and isn't going to be true at any time in the near future," Blount said.

However, dramatic changes are now being made to mobilize the most popular groupware applications — namely, those offered by Lotus and Novell, Inc.

Novell's latest GroupWise application includes a bevy of mobile-aware capabilities, not the least of which is message-based replication, said Frank Gioffre, an electronic-mail architect at the Naval Ware Center in Lakehurst, N.J.

Lotus will offer similar mobile replication functionality in Notes 4.0, which is slated to ship in the first half of this year. Lotus officials would not comment on whether they will continue to offer the same Notes client for mobile users as for networked ones.

— William Brandel and Michael Fitzgerald

Wysiwyg

Ready for Valentine's Day

For those closet poets out there, 1-800-Flowers is sponsoring an on-line romantic poetry contest. Contestants must pen a poem of 20 lines or fewer telling how they met their loved one, the wackiest thing they have done in the name of love, their favorite flower and why they deserve the contest's prize package. The contest can be accessed on the Internet next week at **http//www.800flowers.com** or by E-mail at **Toflowers@aol.com**. The winners will receive a three-day trip anywhere in the U.S. and a monthly floral arrangement.

Hello, support desk?

"Modems and pay phones don't mix. I hot-wired my laptop into the mouthpiece of a pay phone and proceeded to do system maintenance on a customer's machine. The sheriff arrived shortly after and proceeded to interrogate me. Someone had called the police complaining that I was using a computer to steal money from the pay phone."

"My dog goes nuts when I run Windows."
The person's monitor had a cracked flyback transformer. When the multisync monitor switched scan rates upon entering Windows, the high-frequency audio produced by the broken flyback was heard by the dog.

"My hard disk won't boot."
I suggested they take the floppy out of drive A. Later when I arrived, they had successfully removed the floppy drive from the machine (with the floppy disk still inside).

Source: "Support, Santa Cruz Style or Where Do These People Come From?" by Jeff Liebermann, Ben Lomond, Calif.

Your new aerobics instructor

Tired of the aches and pains associated with working in front of a computer all day? **Envision Software** in Redmond, Wash., has introduced ergonomic software that makes users stop and take a break. **Stop-N-Stretch**, which costs $39, can be loaded on a PC or network and is activated by the time of day or time of computer use. A window appears on the screen and prompts users to begin a customized exercise routine. Exercises are included for neck pains, carpal tunnel syndrome, lower back pain and fatigue.

WYSIWYG COMPILED BY TIM OUELLETTE ILLUSTRATIONS BY DAVID MARSHALL

Inside Lines

No more ax grinding in Armonk

IBM Chairman Lou Gerstner figures that 35,000 whacks at IBM's workforce should be about right. In a rah-rah New Year's speech to IBM employees last week, the chairman said he expects to put the chopping block away once the company pares the worker population down to the 215,000 range, which it should reach by June. That will undoubtedly be cold comfort to the 7,000 or so employees that still have to be let go to reach the target, but the lucky ones who remain should be spared the Lizzie Borden treatment.

Now you Seer it, now you don't

In a development sure to cause lots of FUD (and we're not talking Elmer, here), Seer Technology will announce this week that it has been granted a U.S. patent on four critical elements needed to create true second-generation client/server applications. The company has patented the rights to a handful of essential technologies that enable developers to automatically generate code across multiple platforms. "Everyone, including IBM and Apple, that wants to distribute applications across multiple platforms will have to go through these people first," according to a source briefed last week.

The object is skiing

In an effort to coax stay-at-home technology managers to attend a seminar on object development, Covia Technologies is giving away lift tickets to winter resorts in such locales as Aspen and Vail, Colo. Ski bunts who can endure a $650, two-day class on object-oriented tools this week will get the lift tickets, according to a source at Covia in Englewood, Colo.

IBM Credit snaps up Chrysler integration unit

An IBM Credit Corp. spokesman confirmed last week that the company is negotiating to buy Chrysler Systems, a systems integrator and information technology consulting firm in Oakbrook, Ill. According to another source, the two companies reached a definitive agreement in late December. The Chrysler systems integration unit, a subsidiary of Chrysler Financial Corp., focuses primarily on helping clients manage client/server computing environments.

So much for multiculturalism

IBM is close to completing a plan that will turn the melting pot of its current server hardware lineup into a monolith of conformity within the next two years. By midyear, a special division set up to standardize core components used in IBM's mainframe, AS/400 and RS/6000 lines expects to have blueprints mapped out for both the technical and organizational changes that are required.

Teaching an old dachshund new tricks

Software AG will try to bring the mainframe version of its Adabas database into the modern relational world this year by adding things such as triggers, stored procedures and referential integrity. The features are being built into a new Version 6 that is scheduled to be released next summer. The Version 6 launch will also include a slimmed-down and purely relational Adabas D server for Unix systems that Software AG hopes can compete on more even terms with the Oracles and Sybases of the world.

And now some humor from Redmond, Wash., the center of the dweeb universe. So God pays visits to Bill Clinton, Boris Yeltsin and Bill Gates. Clinton announces he has good news and bad news: God exists, but the world is going to end in 48 hours. Yeltsin announces he has bad news and worse news: The world is going to end in 48 hours, and God really does exist after all. Finally, Gates reveals his good news and his better news: The Messiah is not only returning to earth, but OS/2 is only going to be sold for another two days. To pass along other sophisticated tidbits of news or humor, get in touch with Computerworld *via our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by phone at (508) 820-8179, on the Internet at mjohnson@cw.com or through MCI Mail at 590-8017.*

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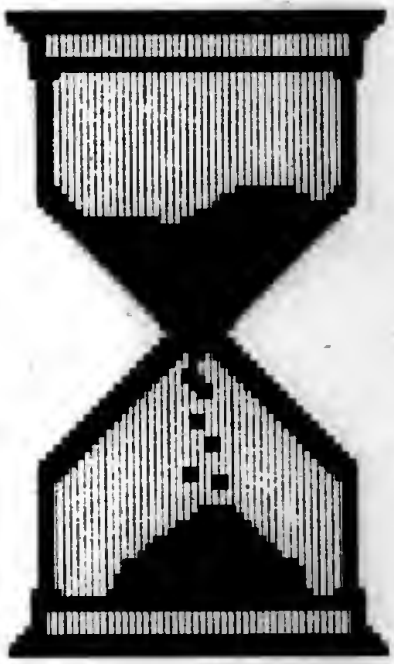

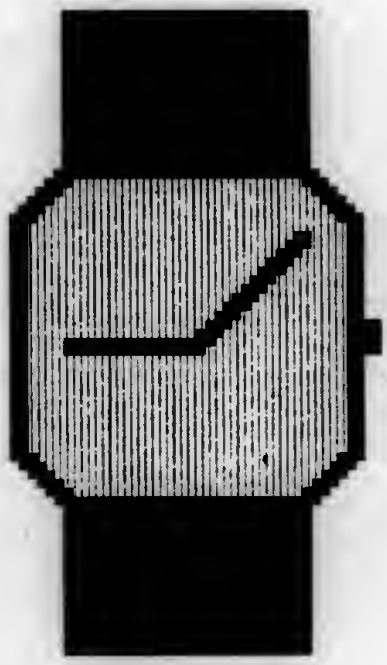

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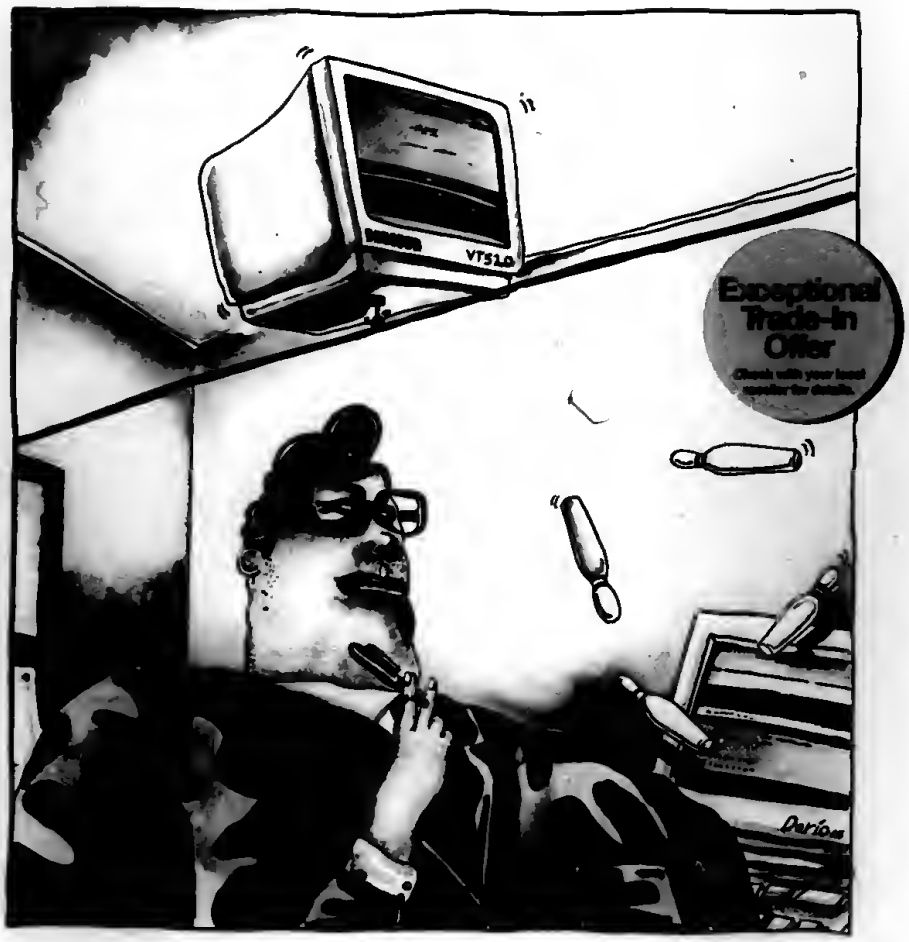

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